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POLAR MOTION DETERMINATIONS BY U.S. NAVY DOPPLER SATELLITE OBSERVATIONS

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FOREWORD

The axis of rotation of the earth is not fixed in the earth; the imaginary point where the axis intersects the earth's crust describes a roughly circular motion, five to ten meters in radius, with a period of 400 days. This "Chandler Wobble" has been precisely measured by astronomical techniques for many years. In 1969, U.S. Navy scientists found that the motion could be determined with the use of Doppler observations of an artificial earth satellite. This report reviews the results obtained during the past year. It was prepared in response to an invitation by Professor P. Melchior to discuss the results during meetings of the Commission on the Rotation of the Earth at the Brighton General Assembly of the International Astronomical Union in August 1970.

The satellite orbits upon which these results are based were computed under the direction of Steve J. Smith using computer programs prepared largely by Treva B. Daniels. Larry Beuglass collaborated with the author in determining the position of the pole from these data with the able assistance of V. Louise Brooks. We are particularly grateful to Charles J. Cohen for his technical guidance in all aspects of the satellite geodesy program.

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22 July 1970

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ABSTRACT

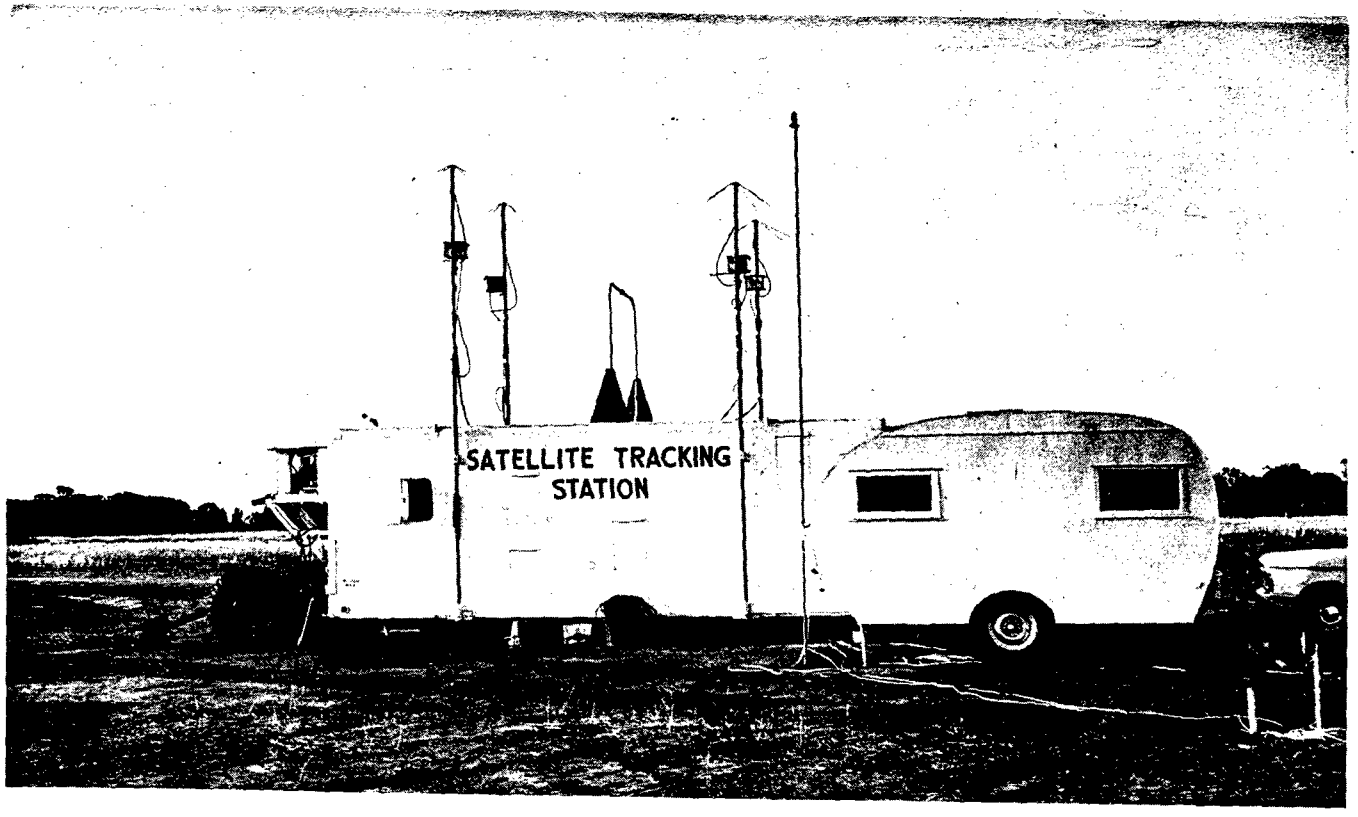
The irregular motion of the earth's axis of rotation, known as Chandler Wobble, has been determined on the basis of Doppler observations of Navy Navigation Satellites. Measurement precisions of about 0.5 meters have been obtained for averaging times of six days. Agreement with astronomical determinations is better than one meter over the last two years. The discrepancies are no larger than differences between results for different groups of observatories as reported by the Bureau International de L'Heure and by the International Polar Motion Service.

INTRODUCTION

Doppler satellite observations have been used in the development and operation of the Navy Navigation Satellite System (Kershner, 1967) since the launch of the Transit 1B satellite in 1960. The usefulness of such observations for geodetic applications, indicated in 1963 (Anderle and Oesterwinter), was exploited in succeeding years (Anderle 1967). During the course of these geodetic operations, it was found that the relation between the earth's geographic pole and the earth's instantaneous spin axis could be obtained as a by-product of this work (Anderle and Beuglass, 1970 a,b). The use of Doppler observations for such determinations of the position of the pole is described below. It should be emphasized that the determination is made from intermediate output of the geodetic operations at minimum cost; improved computational procedures applied to the original observational data would produce somewhat more accurate values for the position of the pole. A considerable improvement in results is evident over the course of the last three years as a result of computational changes designed to improve geodetic operations. Changes in computational procedures specifically designed to improve polar motion results are also being made.

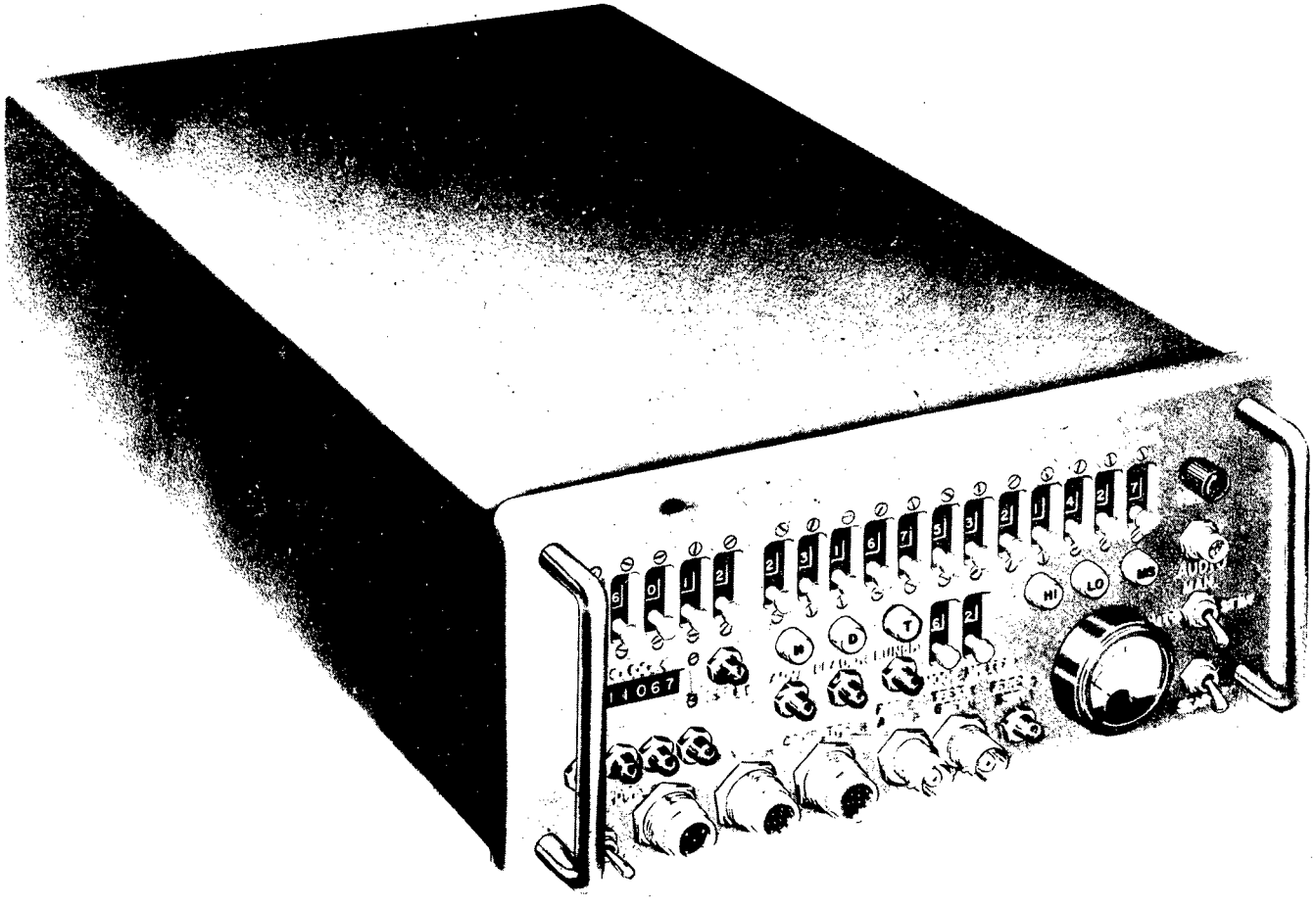
OBSERVING EQUIPMENT

Thirteen semi-permanent satellite observing stations have been used to obtain Doppler data for geodetic applications; but at any given time, observations may also be received from a dozen mobile or cooperating stations. For the sake of consistency, the polar motion results reported to date primarily reflect the observations made at the 13 geodetic stations. While details of the design of the Doppler equipment varies from station to station, the measurements obtained are essentially the same. The Howard County, Maryland, station is one of the most elaborate sites. It includes two complete stations which permits controlled tests of modifications to the equipment. The Applied Physics Laboratory of Johns Hopkins University, which has responsibility for the technical operation of the observing net, operates a control center also located at Howard County, Maryland. The control center receives the observations from all sites daily by teletype and advises the stations of the quality of the observations. The operation and logistic support for the field stations is the responsibility of the Doppler Satellite Office at the Pacific Missile Range (PMR), California. The majority of the sites are actually operated by the faculty and students of the New Mexico State University under contract to PMR. Figure (1) shows one of the mobile vans used in operations such as determining the position of LORAN navigation beacons. The van is the most compact equipment used to date in such geodetic operations. New equipment, designated GEOCEIVERS, are now in production. The equipment, shown in figure (2), weighs under 100 pounds, exclusive of the power source. This equipment will produce data which are different in form, but equivalent in accuracy, to those from the current system. But, since the equipment has not been used in polar motion calculations to date, its data format will not be discussed here.



DOPPLER MOBILE VANS

Figure (1)



MOCK-UP OF GEOCEIVER

Figure (2)

Each station is capable of receiving on at least four frequencies which are approximately 150, 162, 324 and 400 Mhz. Polar motion results have been based on observations of the Navy navigation satellites which transmit at about 150 and 400 Mhz. The receiving stations combine these signals by analog means to obtain a signal which is free of first order ionospheric refraction effects (Newton 1967). The combined signal is then mixed with a reference signal and the time required to count a preset number of beats between the frequencies is measured. The measurements, started each four seconds of time and lasting almost a second, are automatically punched on teletype tape. The time at which satellite time pulses are received are interspersed among these measurements at two minute intervals for use in synchronizing the ground station clocks. The 300 or so observations are preceded by a manually punched header message which includes calibration constants and identifies the station, satellite, date, and hour. The entire message is transmitted by teletype to the control center shortly after the pass is completed. The control center transfers the data from paper tape to magnetic tape for use in the computers.

GEODETIC COMPUTATIONS

The satellite observations are transmitted from the control center in Maryland to the computational facility at the Naval Weapons Laboratory, Dahlgren, Virginia, every 24 hours over a telephone line in a magnetic tape-to-magnetic tape transmission. It is convenient for the geodetic computations to compute the orbit of any selected satellite every second day based on 48 hours of observations. This interval is long enough to permit a determination of the position of mobile observing stations but short enough to maintain a regular check of the performance of the equipment. The raw observations are converted to frequency measurements, and various calibration, filtering and aggregating operations are performed (Anderle, 1965). The time pulses received from the satellite by the Howard County observing station are used to calibrate the epoch and rate of the satellite clock against UTC; the calibrated clock transmissions are then used to synchronize the clocks at the other observing stations. The filtering process eliminates observations which are bad due to loss of lock of the satellite signal or transmission errors; the filtering also detects entire passes which show systematic errors. Finally, groups of eight filtered observations are aggregated in an averaging process to obtain about 40 observations of frequency with associated standard errors for each satellite pass for use in the orbit refinement. In the least squares orbit determination, the earth's gravity field and the coordinates of the thirteen base stations are fixed at values obtained in a general geodetic solution. Changes in these parameters were made in recent years on:

Gravity Field	Station Coordinates
20 Feb 1967	20 Feb 1967
-	19 Jan 1968
18 Apr 1968	-
13 Feb 1970*	-

Unknowns in the solution are the six orbit constants, a drag scaling factor, the coordinates of each mobile observing station, and a frequency and frequency drift bias for each pass. The orbit computation is done by a 10th order Cowell integration and includes effects of lunar-solar gravitational attraction, effect of land tides on the potential (but not on station position), effect of nominal solar radiation pressure, effect of tropospheric refraction for a nominal atmosphere, and the effect of earth's precession and nutation. Extrapolated values for the polar motion and variation in earth's rotation are used. The accuracy of this computed orbit is estimated to be about 10 meters (Anderle, Malyevac and Green 1969) in an earth-fixed coordinate frame. A significant bias in right ascension of the satellite is present because the conversion from UTC to UT-1 time is done using poorly extrapolated values for the difference; however, the longitude of the satellite relative to longitude of the stations is not subject to errors in the difference. Upon completion of the least squares solution for orbit constants and the other parameters described above, the final satellite orbit is used to obtain a measure of the quality of the solution. For this purpose, the orbit and the data obtained on each satellite pass is used to make a least squares solution for frequency bias and for two components of station position: one component is parallel to the satellite velocity vector at closest approach of the satellite to the station while the other component is parallel to the sight line from the station to the satellite at the same time. The standard deviation in these quantities obtained during a month is plotted in figure (3) versus elevation angle to the satellite at closest approach. The graph shows that the errors for passes at high elevation angles are two meters and seven meters in the slant range and tangential directions, respectively, while the errors at low elevation angles are about twice as large due to the greater distance from the station to the satellite and higher residual refraction errors. These errors are a composite of the errors in satellite position, errors in station position, and instrumentation errors. In 1969, it was found that errors in the assumed position of the pole can be found by analysis of these tangential errors.

*For satellite 1967-34A and 1968-12A; 3 Feb and 6 Feb for satellite 1967-92A and 1967-48A, respectively.

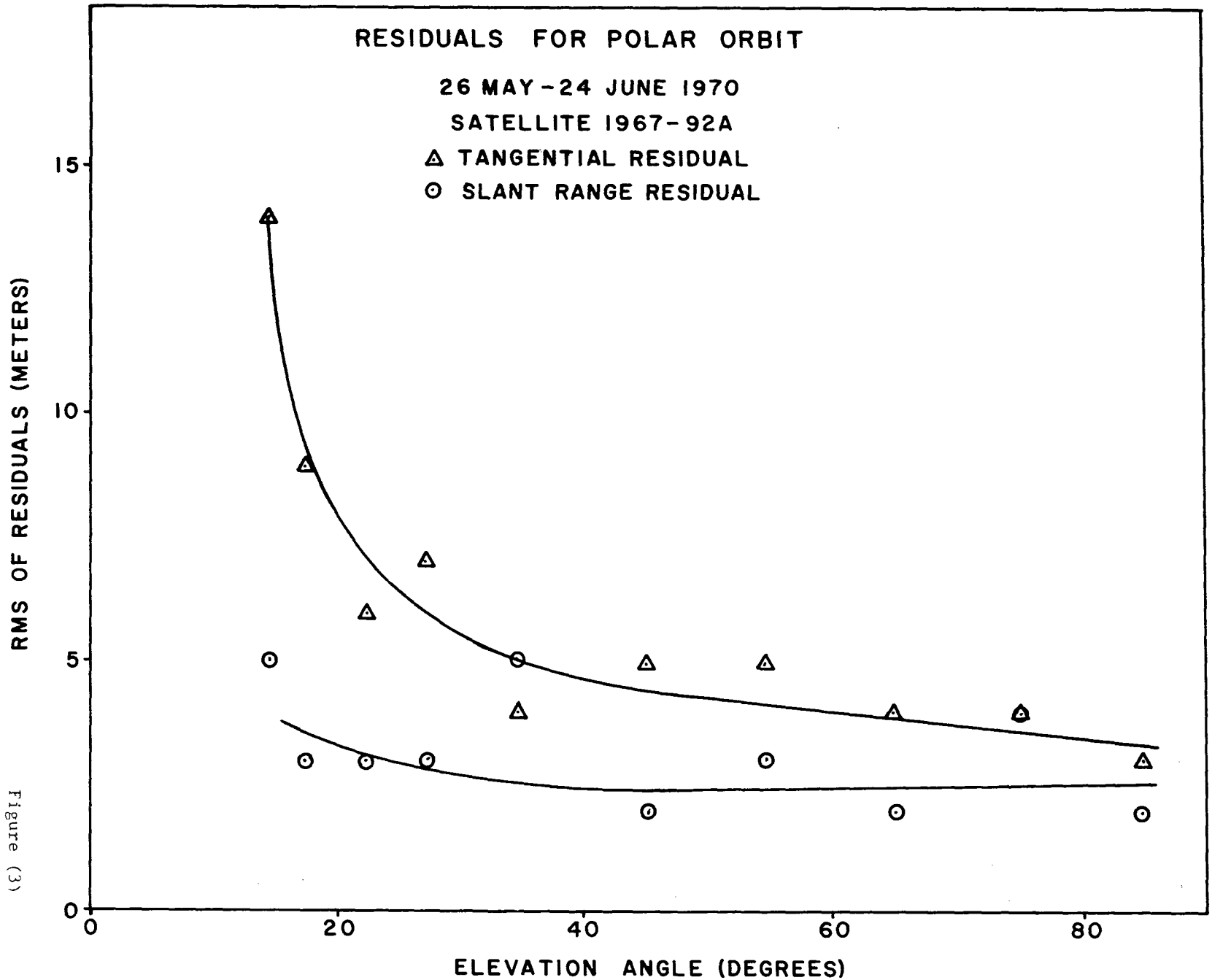

RESIDUALS FOR POLAR ORBIT
26 MAY - 24 JUNE 1970
SATELLITE 1967-92A
△ TANGENTIAL RESIDUAL
⊙ SLANT RANGE RESIDUAL
RMS OF RESIDUALS (METERS)
0
5
10
15
0
20
40
60
80
ELEVATION ANGLE (DEGREES)

Figure (3)

POLE POSITION COMPUTATIONS

The tangential component of the error in the computed satellite orbit determined from each pass of the satellite over each observing station during a two day span is shown in figure (4). The figure shows a sinusoidal error of about 5 meters amplitude with a 24 hour period which was due to the use of an incorrect pole position in the computations. The way this effect arises for a satellite in a polar orbit is shown by the diagrams in figure (5): Assume the true pole is on the spin axis, and assuming that the true pole and the assumed pole lie in the plane of the orbit at some instant of time, as shown in the left side of the figure. Then there will be a tangential error in the computed satellite position (or navigated station position) for any station lying in the orbit plane; six hours later, the assumed pole will have rotated 90 degrees, as shown on the right hand side of the figure, so that there will be zero error in the tangential direction. Thus an error with a 24 hour period is introduced which cannot be absorbed in the solution for orbit constants. The pole position computation consists of the solution for the phase and amplitude of this error and conversion of these quantities to pole position displacement (figure (6)). Such a solution ignores the information on pole position which is contained in the errors in the slant range direction. The slant range errors yield weaker information on pole position because of low sensitivity of slant range to pole position error for stations at low latitudes or for satellite passes at high elevation angle. Until the middle of 1970, the solution for the phase and amplitude of the tangential error also included a constant and a linear term in the least squares solution. The four parameters were used on the theory that imperfect distribution of observations, together with an error in the pole position, may have yielded erroneous values for the mean anomaly and mean motion of the satellite in the fit of orbit constants. Under this assumption, it was necessary to solve for the four parameters using the observations made in the same 48 hour span considered in the orbit fit. It was subsequently found that solutions for the two periodic coefficients based on each 24 hours of observations gave results equivalent to the four parameter solutions based on 48 hours of data. Since more frequent solutions are desirable, future solutions for pole position will probably be based on 24 hours of observations regardless of the time span of data used in the original orbit fit. As shown in figure (3), the accuracy of determination of the tangential errors varies with elevation angle to the satellite at closest approach. The accuracy also varies with the size of the random error of the original frequency observations. Therefore each observation used in the two or four parameter solution is weighted inversely according to the empirical formula $(.004^2 + \sigma^2)\ (6 + 2 \times 10^{-6}(80 - \varphi)^3)^2$ where σ is the random error in the frequency observations in Hz per 108 Mhz and φ is the elevation angle in degrees. The standard error of each solution for pole position is computed from the residuals of fit and covariance of the solution for the nominal weighting of the observations. The standard error of the corrected pole position is about a meter on the average. Means and standard deviations of solutions made in five or six day intervals are also obtained in order to express the results in more compact form.

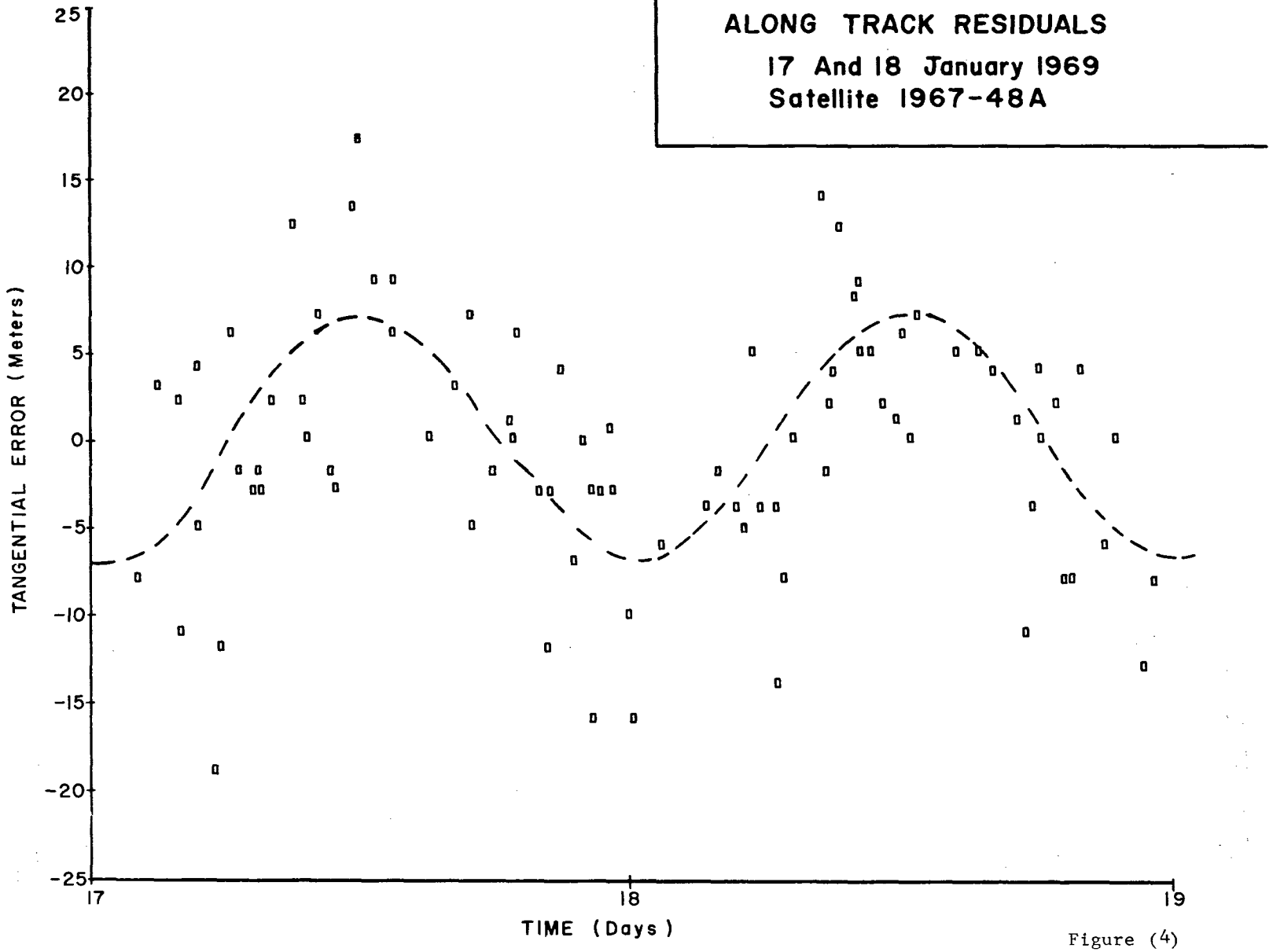

ALONG TRACK RESIDUALS
17 And 18 January 1969
Satellite 1967-48A
TANGENTIAL ERROR (Meters)
25
20
15
10
5
0
-5
-10
-15
-20
-25
17
18
19
TIME (Days)

Figure (4)

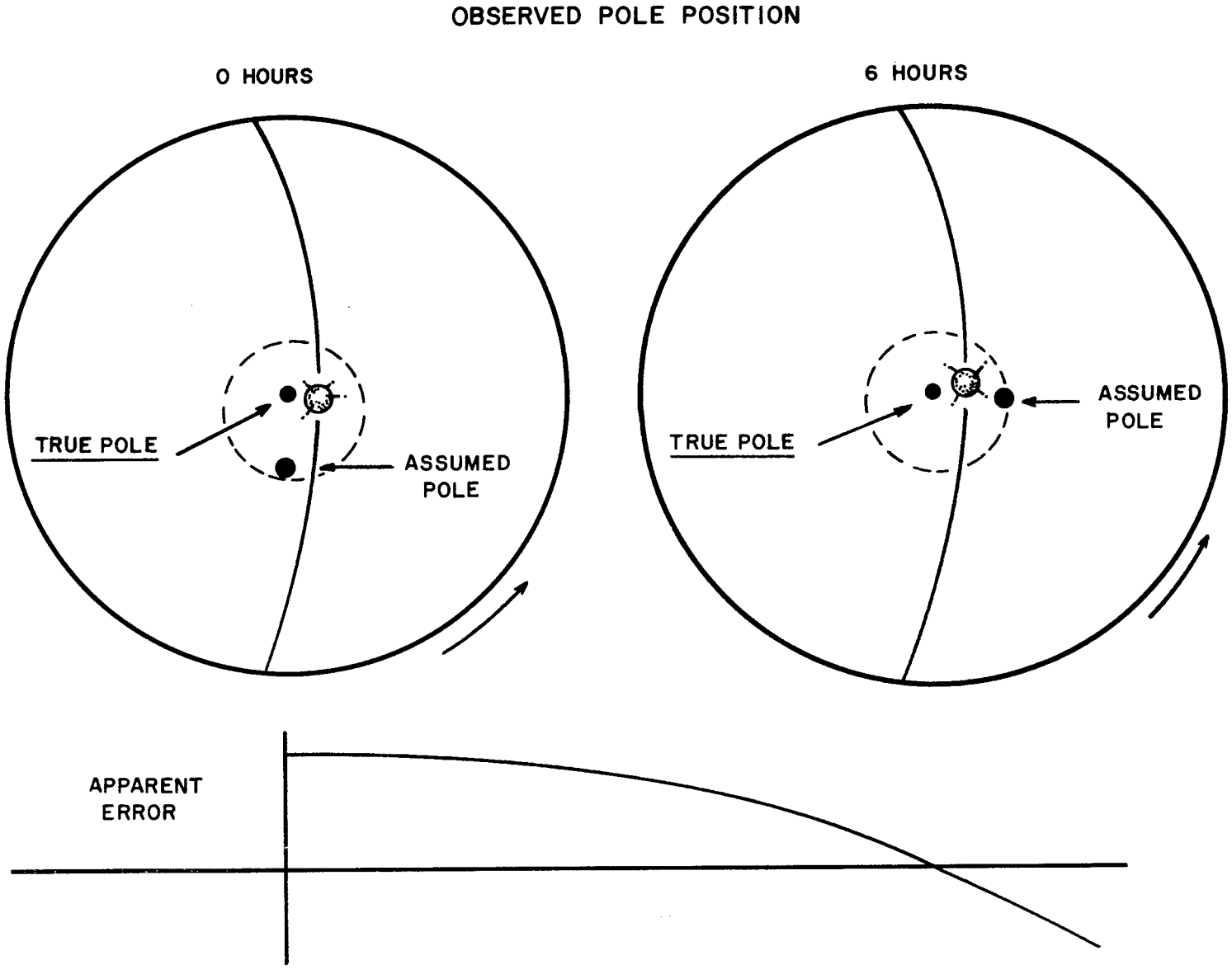

OBSERVED POLE POSITION
0 HOURS
6 HOURS
TRUE POLE
ASSUMED POLE
TRUE POLE
ASSUMED POLE
APPARENT ERROR

Figure (5)

POLE POSITION COMPUTATION

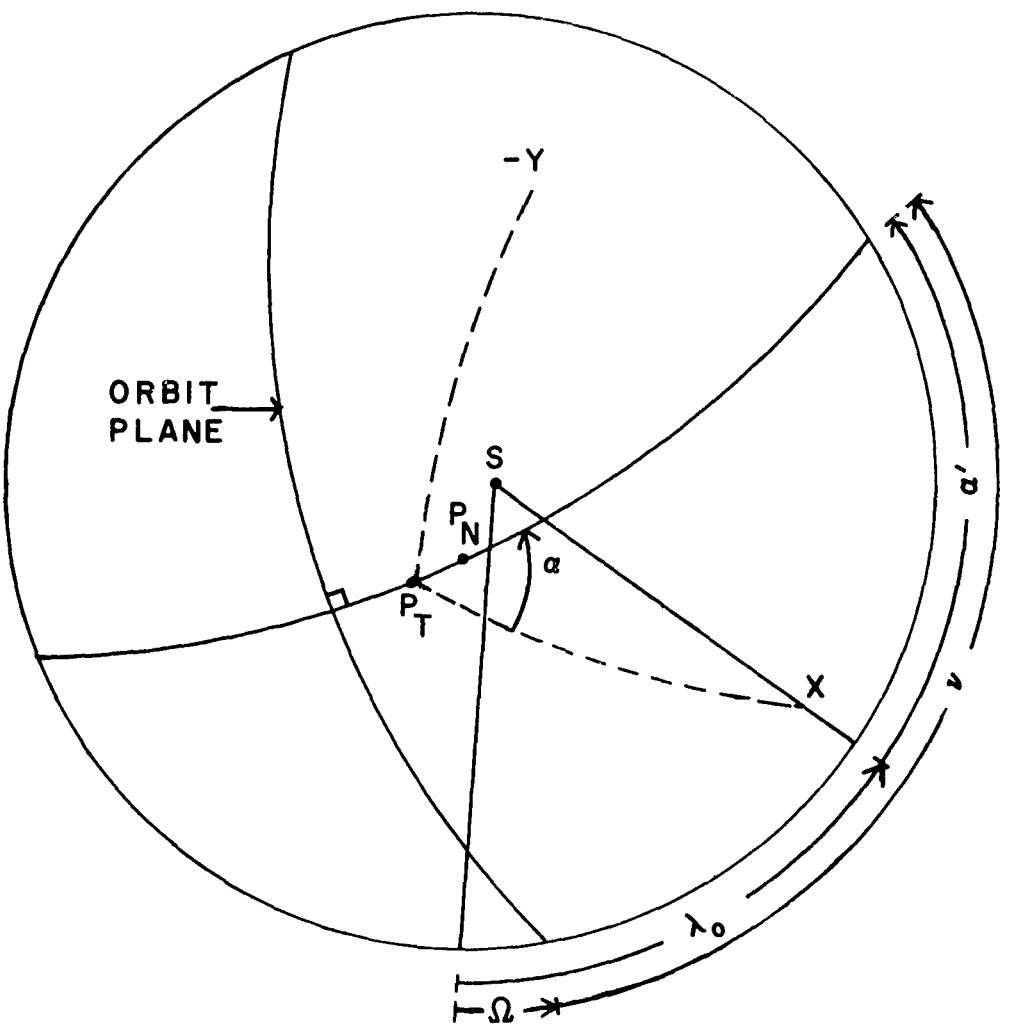
ERROR = A COSλ + B SINλ

λ = HOUR ANGLE OF GREENWICH

P_N = NOMINAL POLE POSITION

P_T = TRUE POLE POSITION

$\overline{P_N P_T}$ IS NORMAL TO ORBIT PLANE WHEN $\lambda_o = \tan^{-1}\frac{A}{-B}$



S = SPIN AXIS

Ω ~ RIGHT ASCENSION OF NODE

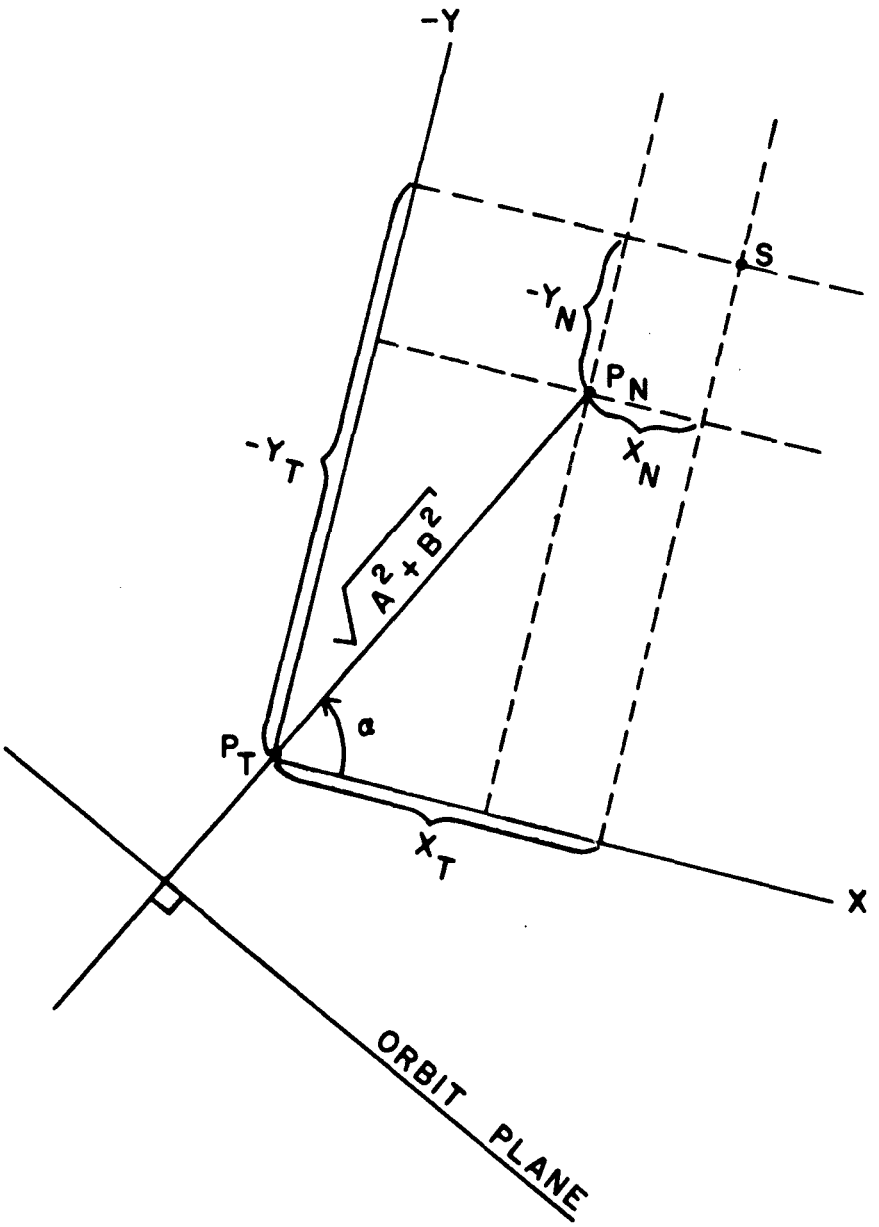
$\alpha' \sim \alpha$

$\nu \sim 90°$

so $\alpha \sim \Omega - \lambda_o + 90°$

Figure (6a)

DETAIL OF POLE POSITION COMPUTATION



$$X_T = X_N + \sqrt{A^2 + B^2}\ \cos\alpha$$

$$Y_T = Y_N - \sqrt{A^2 + B^2}\ \sin\alpha$$

Figure (6b)

ERROR SOURCES

Consideration has been given to the following sources of error in the pole positions computed from Doppler observations of artificial earth satellites:

1. Origin of the coordinate system.
2. Errors in UTC-UT1.
3. Changes in station distribution.
4. Other computational errors.

An attempt was made to refer the coordinates of the Doppler observing stations to the CIO pole through BIH values for the instantaneous pole position at various points during the period 1961-1967 (Anderle and Beuglass 1970a). However, recent Doppler solutions for the position of the pole based on these coordinates show a bias with respect to IPMS and BIH results, particularly in the Y direction. Therefore the following arbitrary corrections must be added to the coordinates reported by the Dahlgren Polar Motion Service to achieve consistency with astronomic results:

$$X_{IPMS} - X_{DAHLGREN} = 0.0 \text{ M}$$

$$Y_{IPMS} - Y_{DAHLGREN} = 2.0 \text{ M}$$

The values for UTC-UT1 used in the Doppler calculations have at best contained significant errors of extrapolation and at worst ignored the (UT2-UT1) correction. In principle, this error should simply yield a different orbit plane in inertial space, leaving earth fixed computations, (including pole position computations) unaffected. Numerical experiments with gross errors in UTC-UT1 have substantiated this theory. While the reference orbits include data from varying numbers of observing stations, pole position calculations have been based on residuals from these orbits for a group of thirteen stations. Only one station in this network has been changed in recent years (Hawaii was moved to Wake). Experiments conducted omitting data from subsets of the station net have shown that (1) significant changes could be made to the station net without biasing the results but that (2) deleting a selected set of four stations from the net would seriously bias the results (Anderle and Beuglass 1970b). Therefore, effects of any future changes in the net will have to be tested. Experiments showed that the adoption of a new gravity field for the computations in February 1970 produced a bias in the pole position of about a meter. The bias may result from readjustment of the first order gravity terms which also produces a diurnal effect on the residuals. All reported results have been corrected for this bias, but the value of the bias is uncertain to few tenths of meters as shown by the results for the following test cases:

	New* Minus Old	
	X	Y
Day 46 1969	-0.1 M	0.5 M
Day 154 1969	-0.6	-0.2
Day 258 1969	-0.3	-0.1
Day 328 1969	0.2	-0.5
Day 50 1970	1.0	0.2
Mean	0.0	0.0
Std Dev	.5	.3
Std Error	.3	.1

Effects on pole position of earlier changes in the gravity field have not been evaluated. However, the earlier results are subject to larger random errors and possible biases due to a variety of deficiencies in the orbit computation program which were corrected in mid-1968.

POLE POSITION RESULTS

The pole positions computed from the results of each orbit computation available from January 1967 through mid 1970 are tabulated in Appendix A. Means and standard errors of results obtained within six day spans are also shown on the tables. The values for the Y coordinates were found to be about two meters lower than the astronomic results. Since the origin of the coordinate system is relatively arbitrary, this bias was corrected before the results were plotted in figures (7) and (8). Starting in mid 1968, the argreement between the Doppler and Astronomic results is about as good as the agreement between the BIH and IPMS results. The agreement for 1969 is especially striking. The Doppler biases in 1967 and early 1968 are probably due to poorer computational techniques used in computing the satellites orbits. The Doppler results for the X coordinate in 1969 are in much better agreement with the IPMS data than the BIH data. However in other places, such as for the Y coordinate in 1967, the Doppler results seem to reflect the trends in the BIH data better than those in the IPMS data. The path of the pole for 1969 determined on the basis of the Doppler observations is shown in figure (9) along with that obtained by the BIH and the IPMS. The ellipses show the standard error of the Doppler observations. The diameter of the Doppler curve in the X - direction is larger than that of the IPMS which in turn is larger than that of the BIH.

*After bias correction

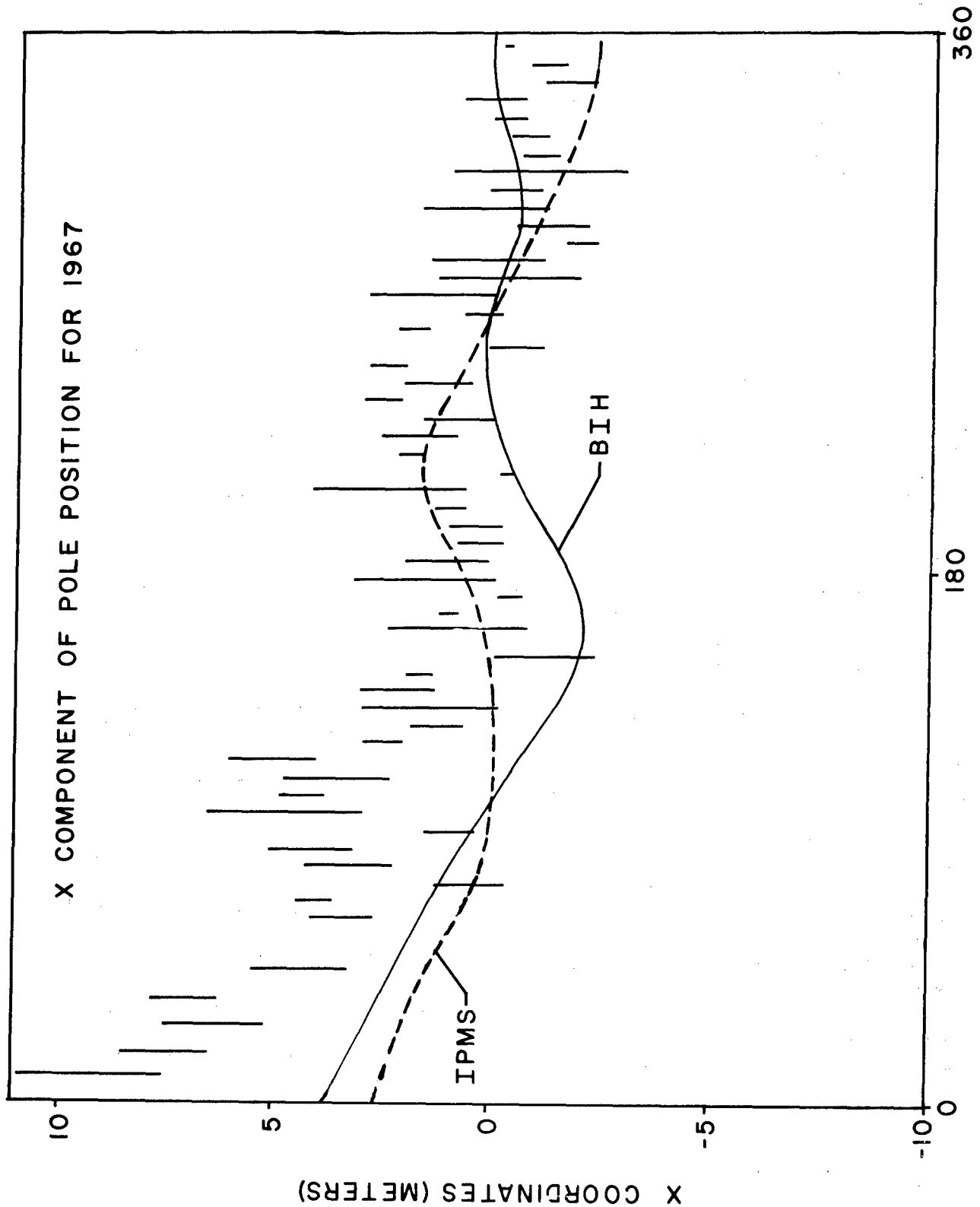

X COMPONENT OF POLE POSITION FOR 1967
BIH
IPMS
X COORDINATES (METERS)
10
5
0
-5
-10
0
180
360
DAYS 1967

Figure 7(a)

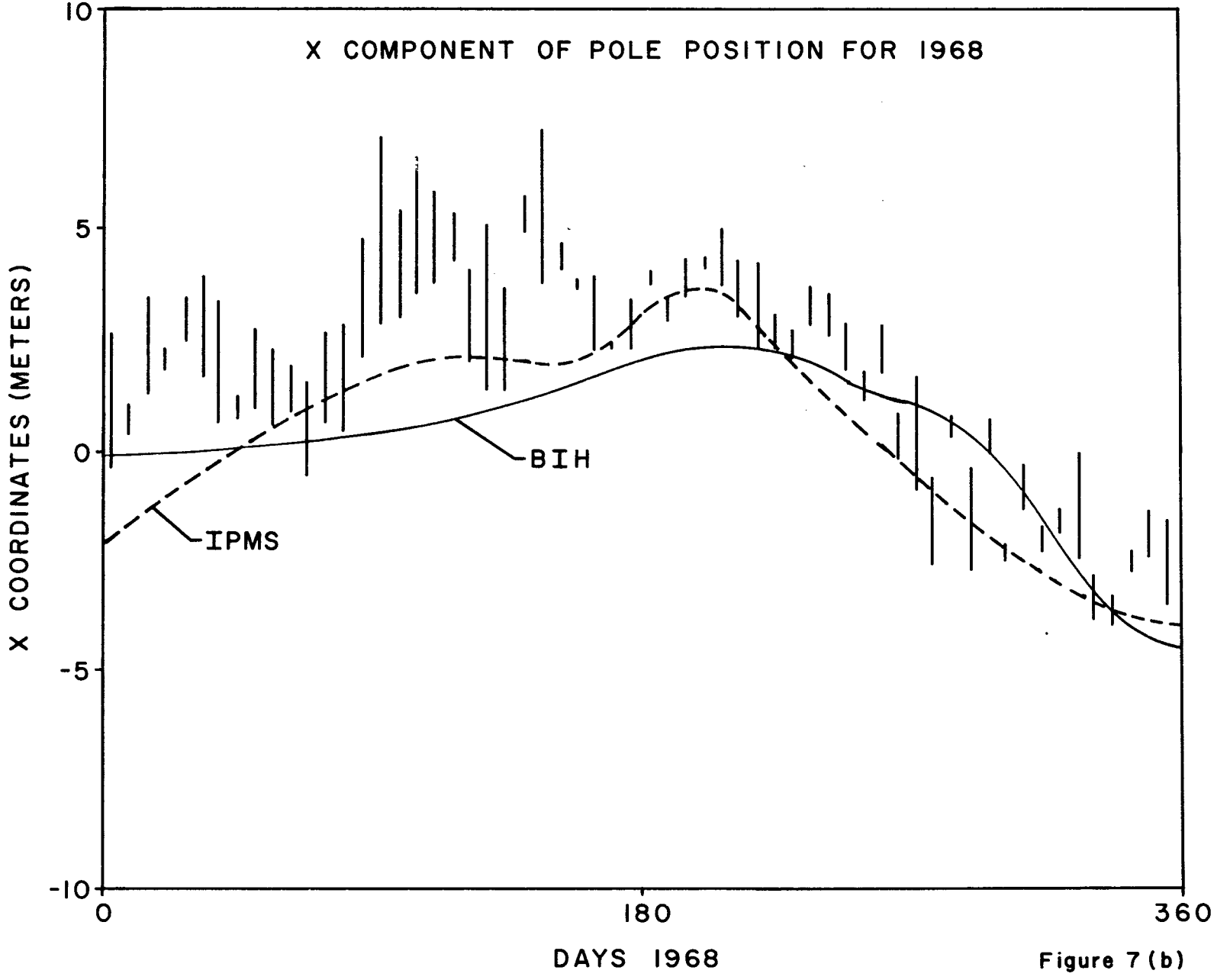

X COMPONENT OF POLE POSITION FOR 1968
X COORDINATES (METERS)
10
5
0
-5
-10
0
180
360
DAYS 1968
BIH
IPMS

Figure 7 (b)

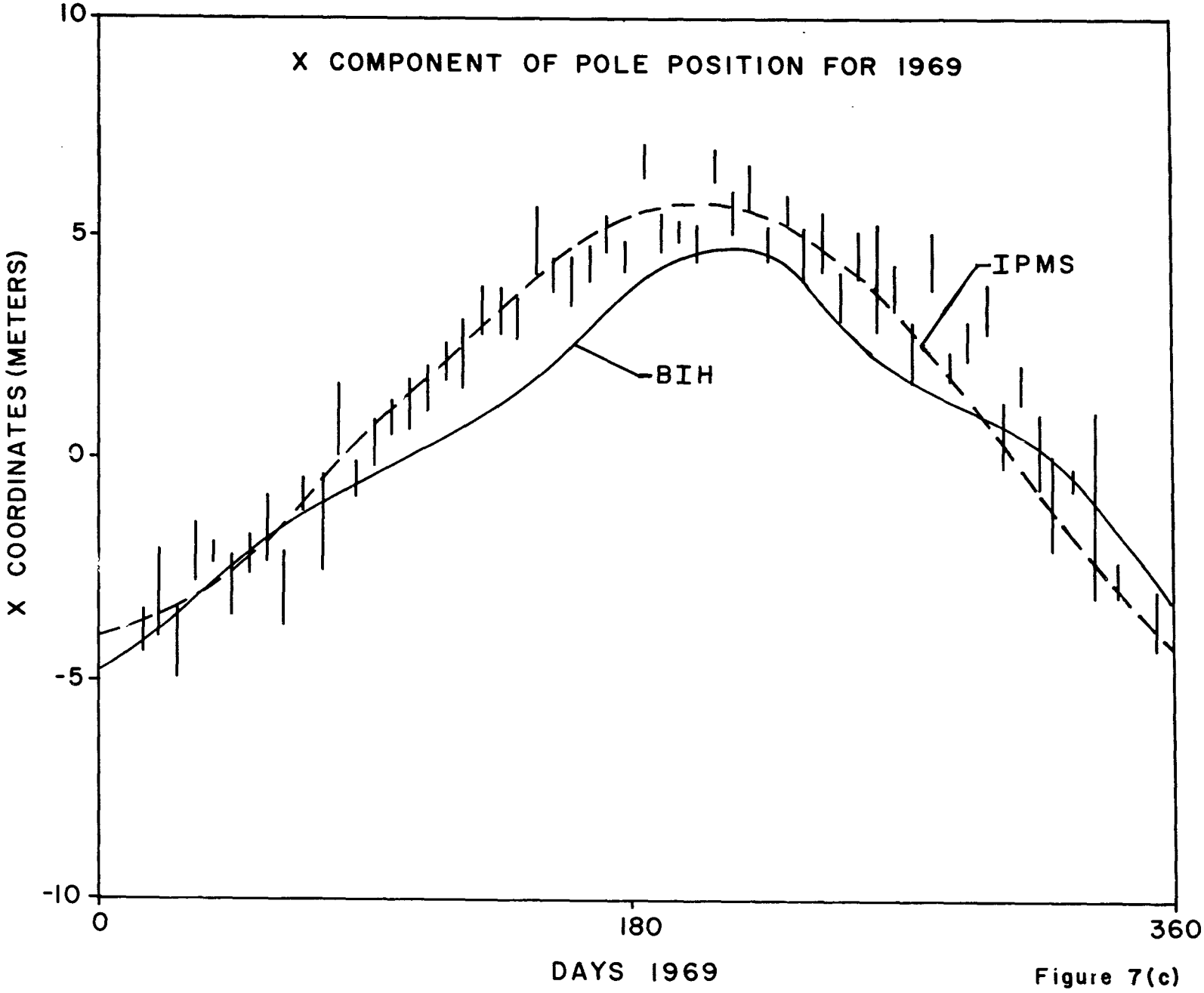

X COMPONENT OF POLE POSITION FOR 1969
X COORDINATES (METERS)
10
5
0
-5
-10
0
180
360
DAYS 1969
IPMS
BIH

Figure 7(c)

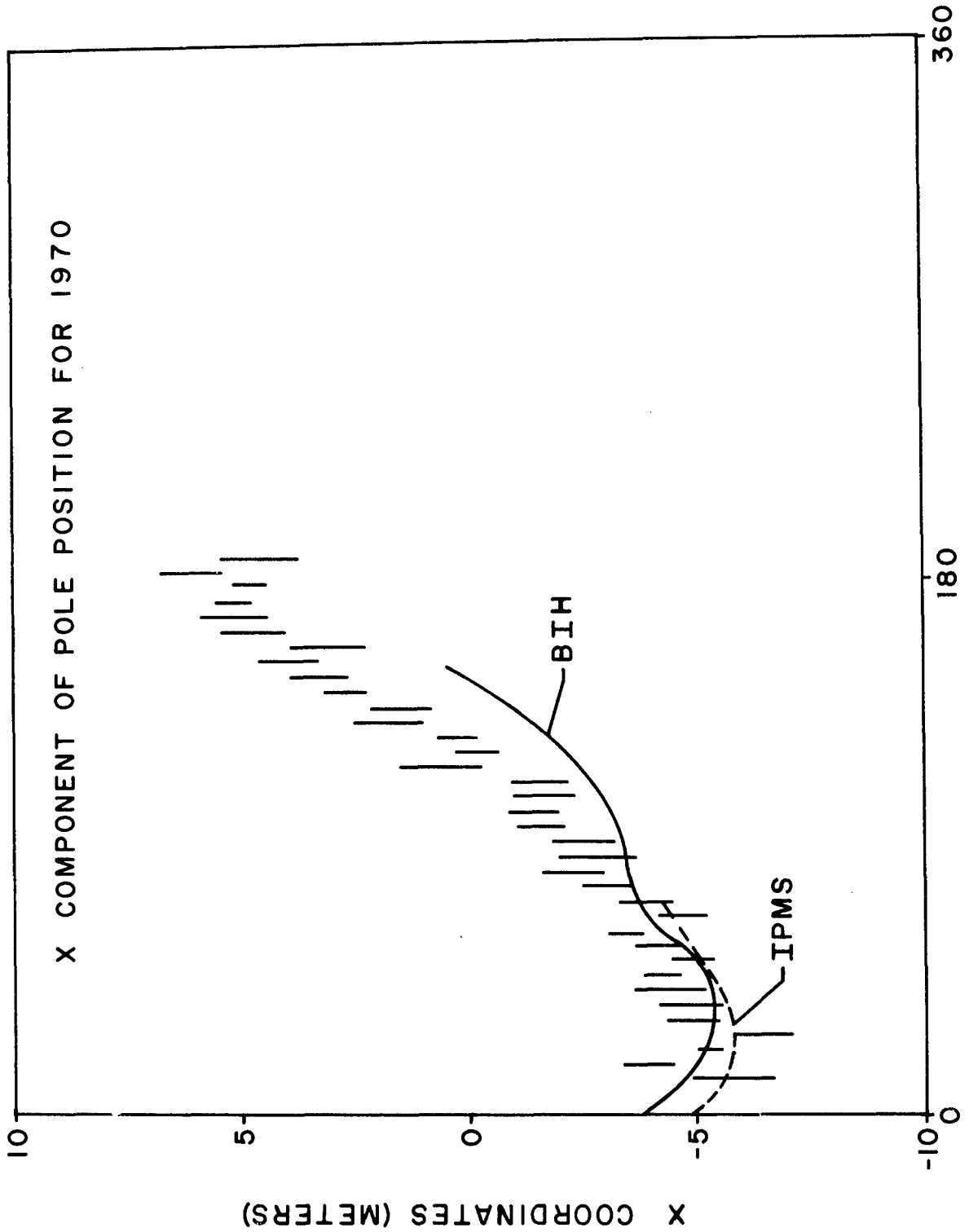

X COMPONENT OF POLE POSITION FOR 1970
BIH
IPMS
10
5
0
-5
-10
X COORDINATES (METERS)
0
180
360
DAYS 1970

Figure 7(d)

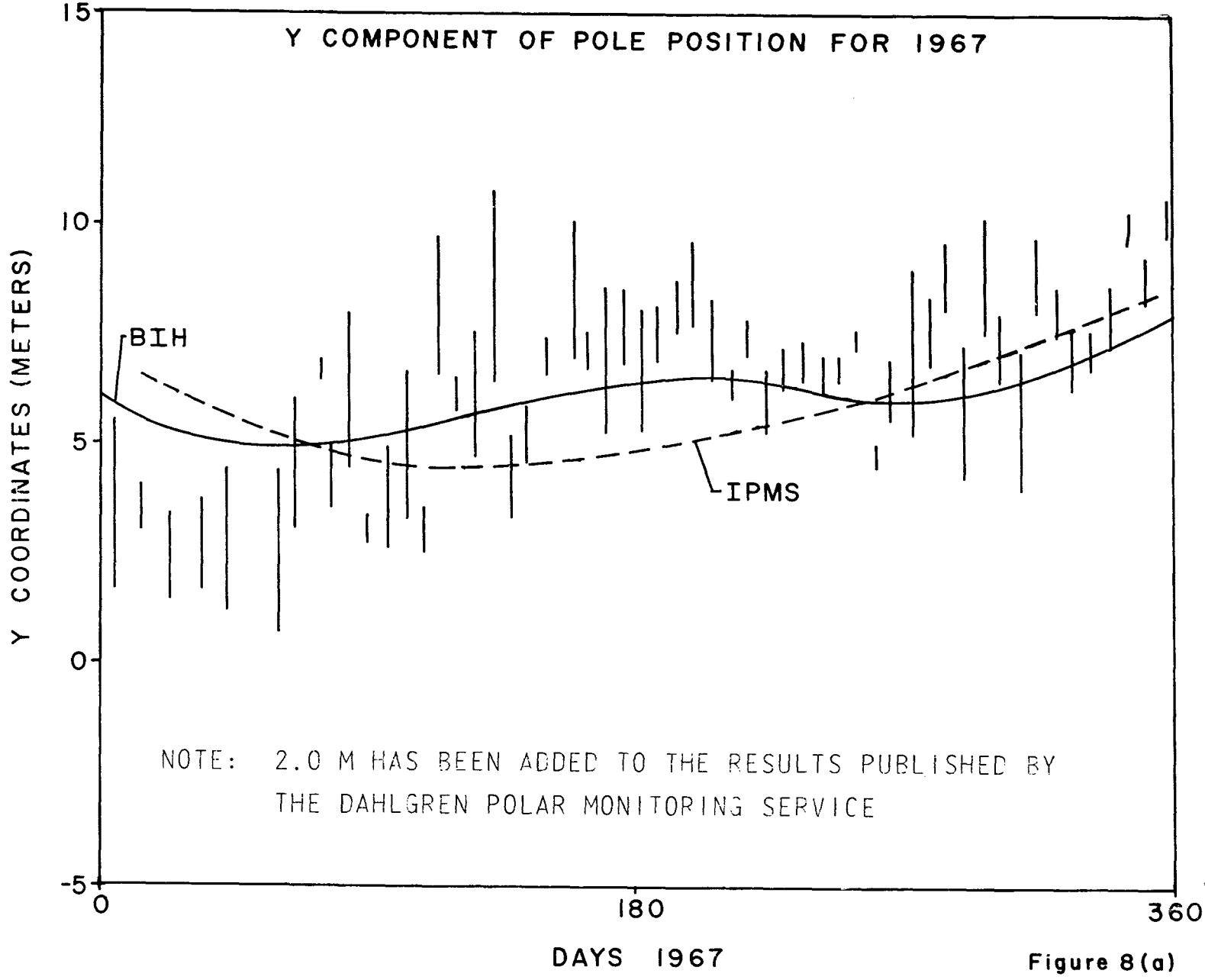

Y COMPONENT OF POLE POSITION FOR 1967
Y COORDINATES (METERS)
15
10
5
0
-5
BIH
IPMS
NOTE: 2.0 M HAS BEEN ADDED TO THE RESULTS PUBLISHED BY
THE DAHLGREN POLAR MONITORING SERVICE
0
180
360
DAYS 1967

Figure 8(a)

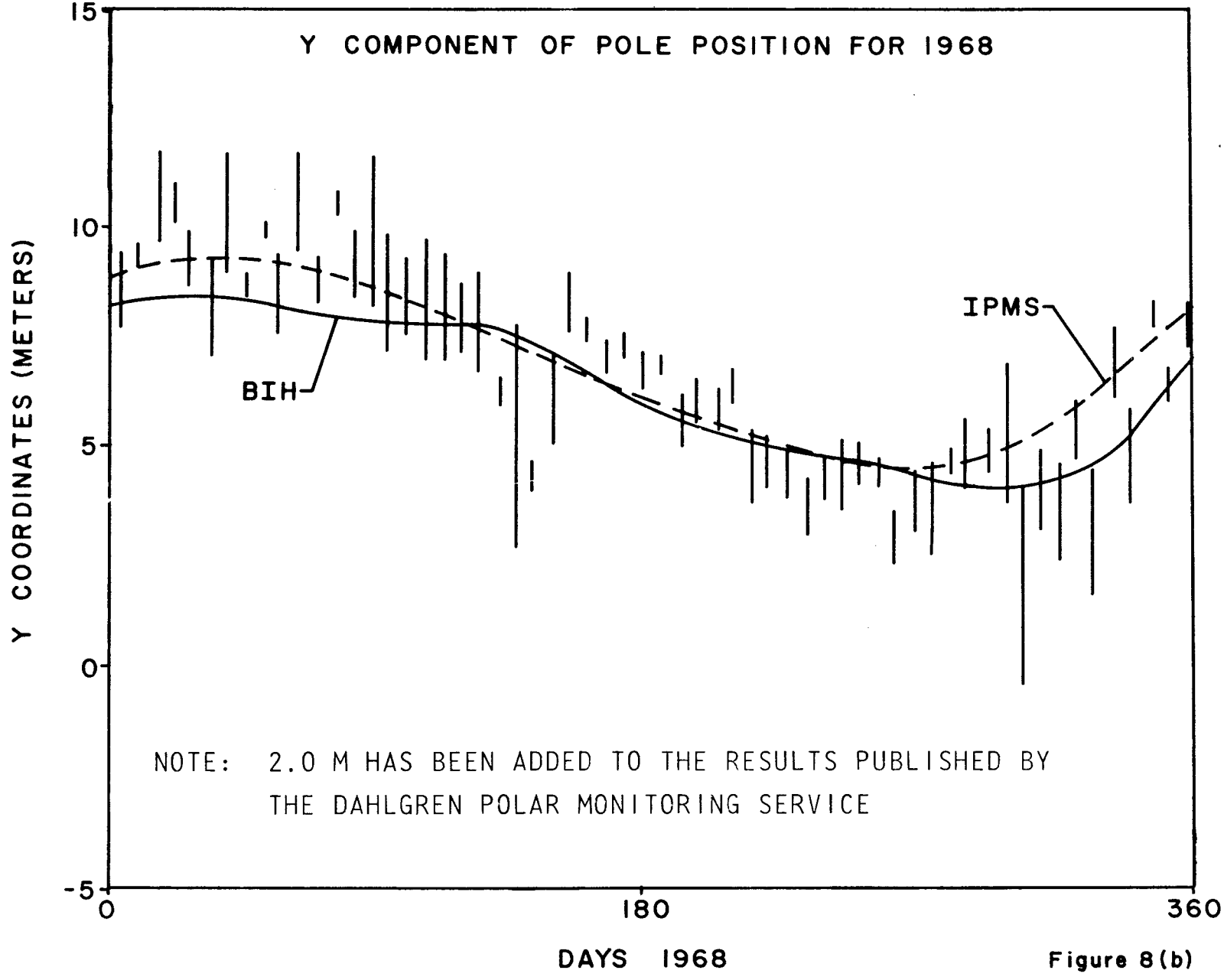

Y COMPONENT OF POLE POSITION FOR 1968
Y COORDINATES (METERS)
15
10
5
0
-5
0
180
360
DAYS 1968
BIH
IPMS
NOTE: 2.0 M HAS BEEN ADDED TO THE RESULTS PUBLISHED BY
THE DAHLGREN POLAR MONITORING SERVICE

Figure 8(b)

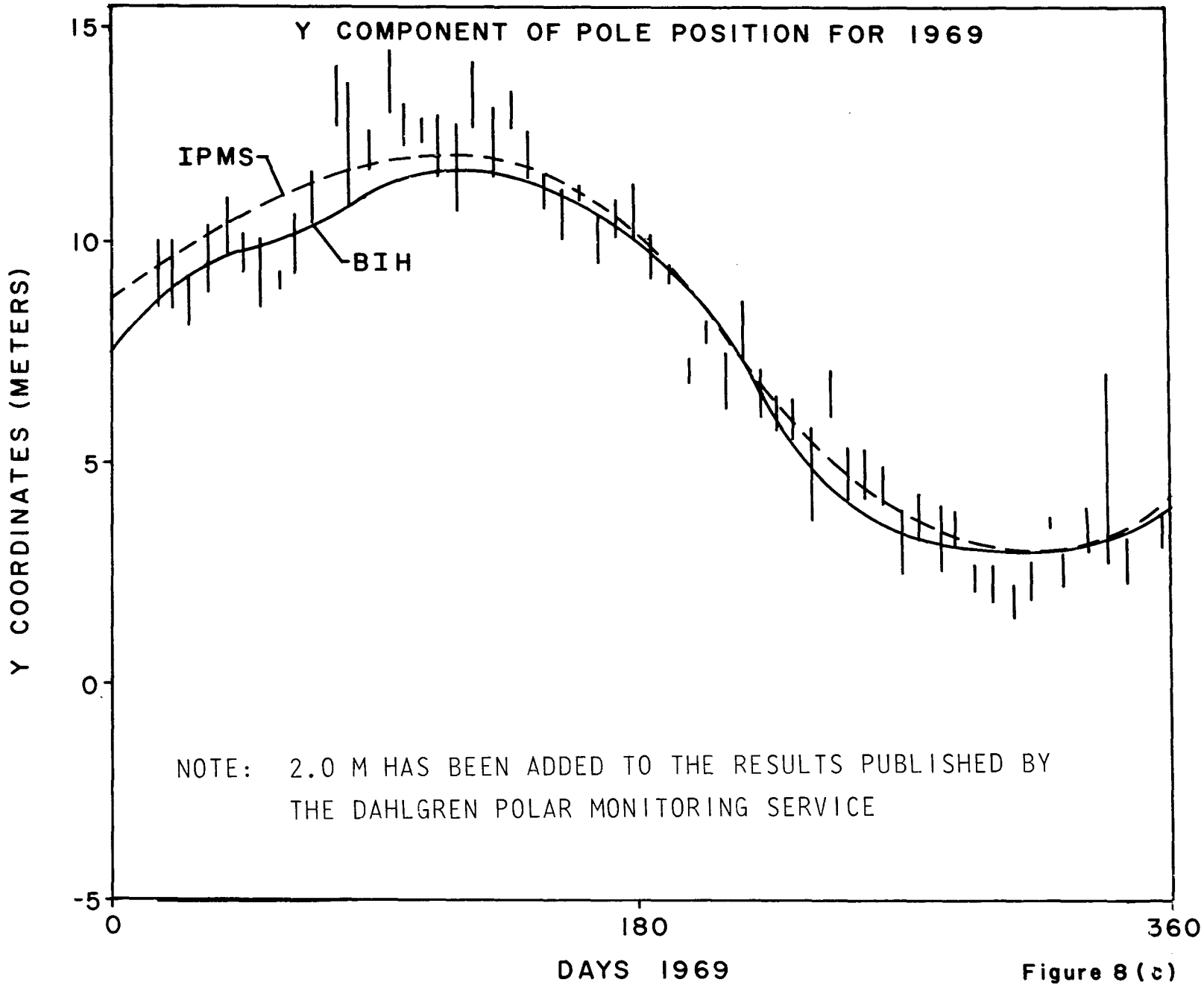

Y COMPONENT OF POLE POSITION FOR 1969
IPMS
BIH
15
10
5
0
-5
Y COORDINATES (METERS)
NOTE: 2.0 M HAS BEEN ADDED TO THE RESULTS PUBLISHED BY
THE DAHLGREN POLAR MONITORING SERVICE
0
180
360
DAYS 1969

Figure 8(c)

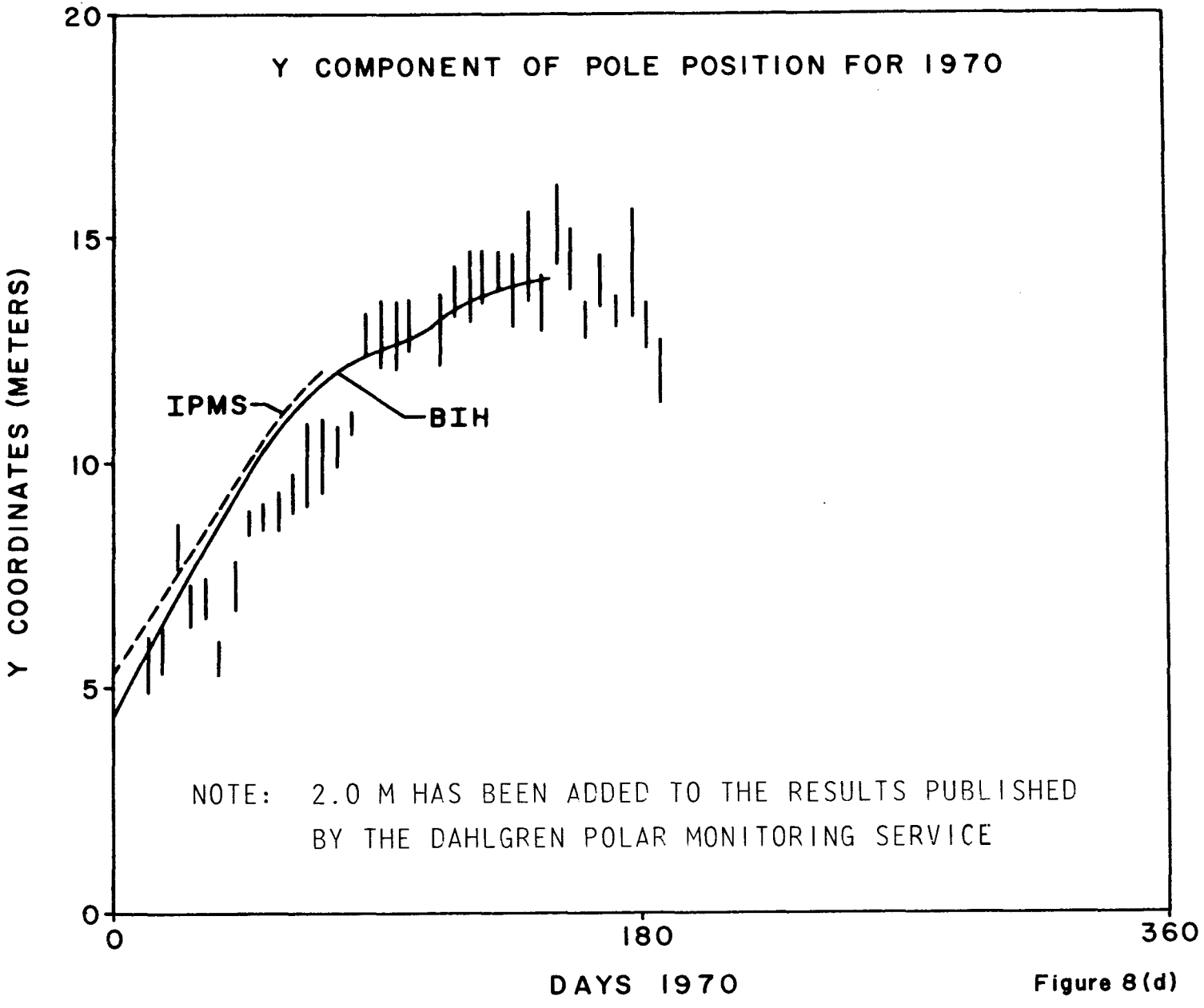
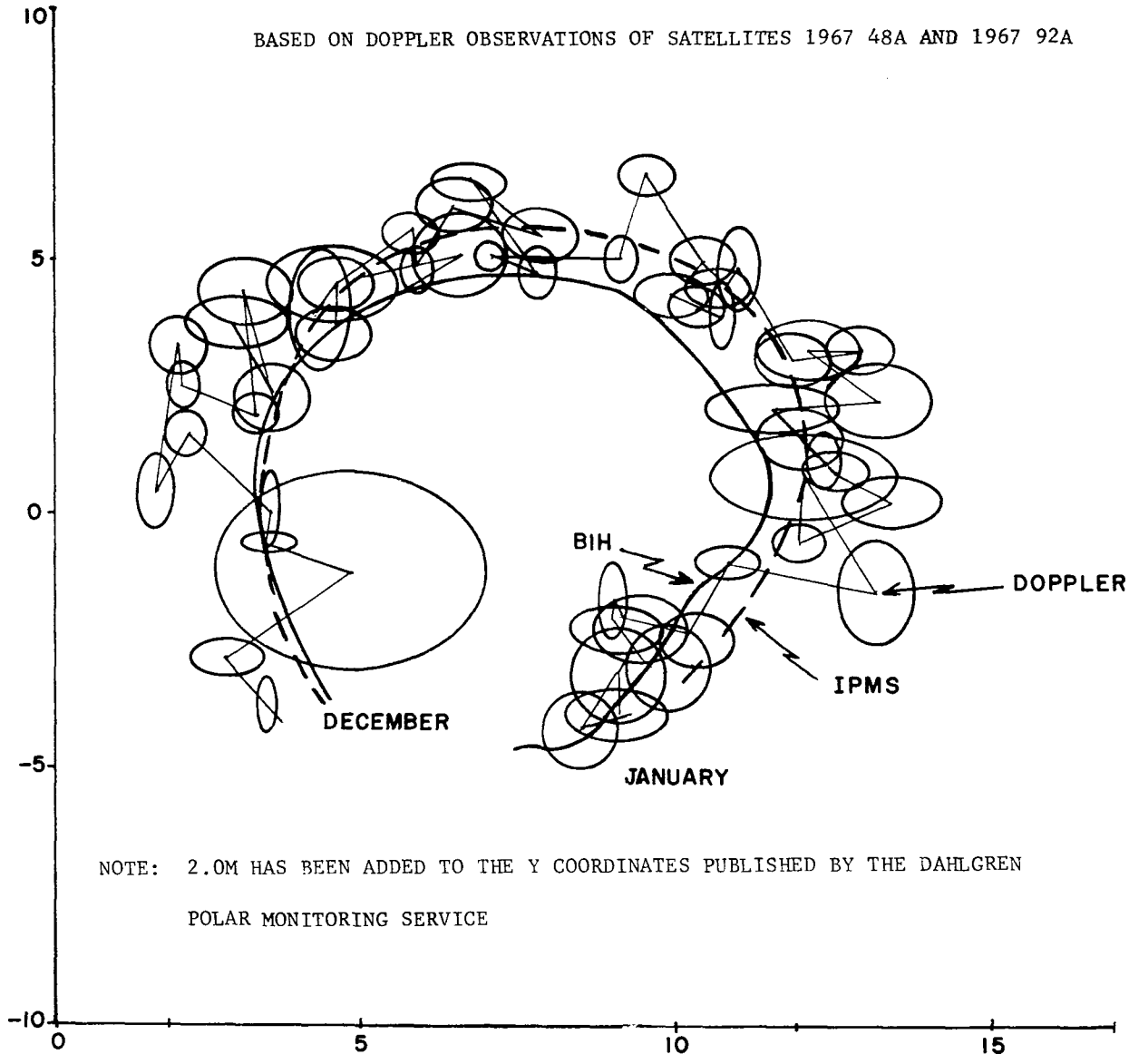

Y COMPONENT OF POLE POSITION FOR 1970
Y COORDINATES (METERS)
20
15
10
5
0
IPMS
BIH
NOTE: 2.0 M HAS BEEN ADDED TO THE RESULTS PUBLISHED
BY THE DAHLGREN POLAR MONITORING SERVICE
0
180
360
DAYS 1970

Figure 8(d)

POLAR MOTION FOR 1969

BASED ON DOPPLER OBSERVATIONS OF SATELLITES 1967 48A AND 1967 92A



NOTE: 2.0M HAS BEEN ADDED TO THE Y COORDINATES PUBLISHED BY THE DAHLGREN POLAR MONITORING SERVICE

Figure (9)

SUMMARY

The irregular motion of the earth's axis of rotation, known as Chandler Wobble, has been determined on the basis of Doppler observations of Navy Navigation Satellites. Measurement precisions of about 0.5 meters have been obtained for averaging times of six days. Agreement with astronomical determinations is better than one meter over the last two years. The discrepancies are no larger than differences between results for different groups of observatories as reported by the Bureau International de L'Heure and by the International Polar Motion Service.

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APPENDIX A

Table 1

TABLE 1

REPORT 0 REVISION 0

DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	1	2	4.47	5.97	1.76	1.91	1966-76A
	3	4	9.27	1.69	1.71	1.85	
	5	6	9.74	4.15	1.74	1.78	
	7	8	7.48	1.00	2.78	2.98	
	9	10	14.98	-5.16	2.00	2.54	
MEAN	1	10	9.19	1.53	2.00	2.21	
STD DEV	1	10	3.84	4.23			
STD ERR	1	10	1.72	1.89			
	11	12	7.51	-.66	1.86	1.89	
	13	14	5.70	1.63	1.83	1.84	
	15	16	5.49	2.14	1.43	1.52	
	17	18	7.76	2.33	1.56	1.46	
	19	20	10.92	2.15	1.41	1.41	
MEAN	11	20	7.48	1.52	1.62	1.62	
STD DEV	11	20	2.18	1.25			
STD ERR	11	20	0.98	0.56			
	21	22	9.62	1.65	1.55	1.47	
	23	24	7.82	1.85	1.75	1.66	
	25	26	6.77	-.73	2.25	2.18	
	27	28	3.95	-2.95	2.32	2.13	
	29	30	3.55	2.06	1.53	1.48	
MEAN	21	30	6.34	0.38	1.88	1.78	
STD DEV	21	30	2.58	2.17			
STD ERR	21	30	1.15	0.97			
	31	32	4.93	-2.25	1.93	1.97	
	33	34	7.66	1.73	1.55	1.44	
	35	36	5.68	0.78	1.24	1.16	
	37	38	7.53	-.24	1.56	1.42	
	39	40	9.15	3.37	1.67	1.56	
MEAN	31	40	6.99	0.68	1.59	1.51	
STD DEV	31	40	1.69	2.11			
STD ERR	31	40	0.75	0.94			
	41	42	8.65	6.47	1.86	1.77	
	43	44	3.52	-.33	1.53	1.44	
	45	46	2.86	-2.18	1.61	1.52	
	47	48	2.54	-2.20	1.92	1.78	
	49	50	4.69	2.46	1.78	1.67	
MEAN	41	50	4.45	0.84	1.74	1.64	
STD DEV	41	50	2.49	3.68			
STD ERR	41	50	1.11	1.64			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE 1966-76A
	59	60	2.17	0.06	2.17	2.31	
	61	62	2.89	-.11	1.92	1.95	
	63	64	2.48	-1.93	2.22	2.20	
	65	66	4.85	3.76	1.76	1.93	
	67	68	4.49	0.44	1.56	1.53	
MEAN	59	68	3.38	0.44	1.93	1.98	
STD DEV	59	68	1.22	2.07			
STD ERR	59	68	0.54	0.92			
	69	70	4.44	2.05	1.94	1.96	
	71	72	3.25	5.54	1.88	2.00	
	73	74	1.99	4.88	1.81	1.90	
	75	76	-.66	4.83	1.86	1.88	
	77	78	0.17	4.46	1.95	1.96	
MEAN	69	78	1.84	4.35	1.89	1.94	
STD DEV	69	78	2.11	1.34			
STD ERR	69	78	0.94	0.60			
	79	80	2.61	2.56	1.94	1.96	
	81	82	1.95	0.99	1.61	1.69	
	83	84	5.33	3.10	1.52	1.75	
	85	86	4.11	2.77	1.70	2.04	
	87	88	5.86	7.70	2.33	2.37	
MEAN	79	88	3.97	3.42	1.82	1.96	
STD DEV	79	88	1.69	2.52			
STD ERR	79	88	0.75	1.13			
	89	90	2.53	1.96	2.04	2.30	
	91	92	1.19	0.84	1.65	1.75	
	93	94	-.13	0.66	1.48	1.70	
	95	96	1.77	1.60	1.97	2.21	
	97	98	2.79	0.72	1.86	2.01	
MEAN	89	98	1.63	1.16	1.80	1.99	
STD DEV	89	98	1.17	0.59			
STD ERR	89	98	0.52	0.26			
	99	100	3.01	0.39	1.77	2.02	
	101	102	8.32	4.01	1.83	2.20	
	103	104	4.39	6.43	1.69	1.93	
	105	106	3.49	1.54	1.83	2.25	
	107	108	5.19	0.87	1.86	2.30	
MEAN	99	108	4.88	2.65	1.80	2.14	
STD DEV	99	108	2.10	2.53			
STD ERR	99	108	0.94	1.13			

DAHLGREN POLAR MONITORING SERVICE

	DAYS 1967		POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	109	110	1.46	0.48	1.64	1.92	1966-76A
	111	112	3.48	2.26	1.52	1.83	
	113	114	5.66	0.58	1.76	2.16	
	115	116	4.36	2.98	1.90	2.32	
	117	118	6.90	6.82	2.11	2.53	
MEAN	109	118	4.37	2.62	1.79	2.15	
STD DEV	109	118	2.08	2.58			
STD ERR	109	118	0.93	1.15			
	119	120	3.93	8.63	1.81	2.05	
	121	122	1.91	4.87	1.71	2.21	
	123	124	2.34	4.04	1.71	2.35	
	125	126	3.31	3.41	1.99	2.67	
	127	128	2.26	1.53	1.77	2.08	
MEAN	119	128	2.75	4.50	1.80	2.27	
STD DEV	119	128	0.84	2.62			
STD ERR	119	128	0.38	1.17			
	129	130	0.51	4.31	1.72	2.22	
	131	132	0.93	6.53	1.61	2.06	
	133	134	1.77	10.85	1.43	1.66	
	135	136	-1.47	5.84	1.51	1.82	
	137	138	3.96	3.05	1.68	1.93	
MEAN	129	138	1.14	6.12	1.59	1.94	
STD DEV	129	138	1.97	2.97			
STD ERR	129	138	0.88	1.33			
	139	140	3.70	4.15	1.84	2.12	
	141	142	2.05	1.66	2.23	2.46	
	143	144	0.64	0.99	2.13	2.37	
	145	146	1.44	2.05	2.09	2.51	
	147	148	1.36	2.90	1.93	2.24	
MEAN	139	148	1.84	2.35	2.04	2.34	
STD DEV	139	148	1.15	1.22			
STD ERR	139	148	0.52	0.55			
	149	150	2.17	4.35	2.24	2.71	
	151	152	0.67	5.50	2.03	2.39	
	153	154	-3.09	4.97	2.23	2.62	
	155	156	-1.07	4.48	1.83	2.04	
	157	158	1.06	1.18	1.96	2.24	
MEAN	149	158	-.05	4.10	2.06	2.40	
STD DEV	149	158	2.06	1.69			
STD ERR	149	158	0.92	0.76			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	159	160	2.43	4.82	1.62	2.06	59
	161	162	-.74	8.00	1.72	1.92	59
MEAN	159	161	0.84	6.41	1.67	1.99	
STD DEV	159	161	2.24	2.25	0.07	0.10	
STD ERR	159	161	1.58	1.59			
	163	164	1.34	5.10	1.90	2.27	59
	165	166	1.11	5.83	1.56	1.85	59
	167	168	0.63	4.39	1.51	1.68	59
MEAN	163	167	1.03	5.11	1.66	1.93	
STD DEV	163	167	0.36	0.72	0.21	0.30	
STD ERR	163	167	0.21	0.41			
	169	170	-.67	2.44	1.57	1.73	59
	171	172	0.18	4.08	1.85	2.17	59
	173	174	-.60	8.07	1.88	2.27	59
MEAN	169	173	-.36	4.86	1.76	2.06	
STD DEV	169	173	0.47	2.90	0.17	0.29	
STD ERR	169	173	0.27	1.67			
	175	176	-.77	7.04	1.36	1.60	59
	177	178	0.88	5.19	1.35	1.68	59
	179	180	4.65	4.31	1.92	2.07	59
MEAN	175	179	1.59	5.51	1.55	1.79	
STD DEV	175	179	2.78	1.39	0.33	0.25	
STD ERR	175	179	1.61	0.80			

DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	181	182	0.58	1.83	1.71	2.05	59
	183	184	2.91	5.92	1.72	1.87	59
	185	186	-.21	5.84	1.62	1.95	59
MEAN	181	185	1.09	4.53	1.68	1.96	
STD DEV	181	185	1.62	2.34	0.05	0.09	
STD ERR	181	185	0.94	1.35			
	187	188	-.55	6.65	1.41	1.61	59
	189	190	0.28	4.60	1.77	1.89	59
	191	192	1.21	5.24	1.74	2.20	59
MEAN	187	191	0.31	5.50	1.64	1.90	
STD DEV	187	191	0.88	1.05	0.20	0.29	
STD ERR	187	191	0.51	0.61			
	193	194	-.74	6.14	1.36	1.50	59
	195	196	1.04	7.25	1.33	1.42	59
	197	198	0.99	5.18	1.71	1.90	59
MEAN	193	197	0.43	6.19	1.47	1.61	
STD DEV	193	197	1.01	1.03	0.21	0.26	
STD ERR	193	197	0.58	0.60			
	199	200	1.50	7.97	1.90	2.08	59
	201	202	1.15	4.59	1.48	1.57	59
	203	204	0.43	6.96	1.36	1.56	59
MEAN	199	203	1.02	6.50	1.58	1.74	
STD DEV	199	203	0.55	1.73	0.29	0.30	
STD ERR	199	203	0.32	1.00			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	205	206	3.09	6.64	1.50	1.87	59
	207	208	5.04	3.35	1.84	2.14	59
	209	210	-.87	5.87	1.56	1.64	59
MEAN	205	209	2.42	5.29	1.63	1.88	
STD DEV	205	209	3.01	1.72	0.18	0.25	
STD ERR	205	209	1.74	0.99			
	211	212	-.50	4.26	1.90	1.91	59
	213	214	-.08	4.23	1.78	1.67	59
	215	216	-.30	4.63	1.49	1.58	59
MEAN	211	215	-.29	4.37	1.73	1.72	
STD DEV	211	215	0.21	0.22	0.21	0.17	
STD ERR	211	215	0.12	0.13			
	217	218	1.64	5.10	1.61	1.52	59
	219	220	2.45	6.11	1.55	1.46	59
	221	222	1.70	4.87	1.03	1.05	59
MEAN	217	221	1.93	5.36	1.40	1.34	
STD DEV	217	221	0.46	0.66	0.32	0.26	
STD ERR	217	221	0.26	0.38			
	223	224	3.41	4.17	1.19	1.32	59
	225	226	1.11	2.62	1.35	1.32	59
	227	228	0.68	5.21	1.32	1.37	59
MEAN	223	227	1.73	4.00	1.29	1.34	
STD DEV	223	227	1.47	1.30	0.09	0.03	
STD ERR	223	227	0.85	0.75			

DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	229	230	1.72	5.14	1.14	1.10	59
	231	232	1.54	3.69	1.27	1.18	59
	233	234	-.73	5.24	1.15	1.13	59
MEAN	229	233	0.84	4.69	1.19	1.14	
STD DEV	229	233	1.36	0.87	0.07	0.04	
STD ERR	229	233	0.79	0.50			
	235	236	3.40	4.46	1.25	1.16	59
	237	238	2.30	5.71	1.20	1.14	59
	239	240	2.09	4.36	1.30	1.20	59
MEAN	235	239	2.60	4.84	1.25	1.17	
STD DEV	235	239	0.70	0.75	0.05	0.03	
STD ERR	235	239	0.41	0.43			
	241	242	2.03	5.45	1.15	1.14	59
	243	244	-.22	4.40	1.55	1.48	59
	245	246	2.13	4.22	1.34	1.23	59
MEAN	241	245	1.31	4.69	1.35	1.28	
STD DEV	241	245	1.33	0.67	0.20	0.17	
STD ERR	241	245	0.77	0.38			
	247	248	2.96	4.89	1.24	1.22	59
	249	250	2.82	4.63	1.04	1.14	59
	251	252	1.68	4.36	1.02	0.93	59
MEAN	247	251	2.49	4.63	1.10	1.10	
STD DEV	247	251	0.70	0.26	0.12	0.15	
STD ERR	247	251	0.40	0.15			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	253	254	0.64	5.76	1.53	1.47	59
	255	256	-.55	4.88	1.62	1.64	59
	257	258	-1.50	5.53	2.16	2.11	59
MEAN	253	257	-.47	5.39	1.77	1.74	
STD DEV	253	257	1.07	0.46	0.34	0.33	
STD ERR	253	257	0.62	0.26			
	259	260	1.20	2.29	2.22	2.22	59
	261	262	2.22	2.88	1.85	1.81	59
	263	264	2.27	3.07	1.84	1.85	59
MEAN	259	263	1.90	2.74	1.97	1.96	
STD DEV	259	263	0.60	0.41	0.22	0.23	
STD ERR	259	263	0.35	0.23			
	265	266	0.50	5.48	1.81	1.72	59
	267	268	0.87	3.70	2.11	1.97	59
	269	270	-.52	3.22	2.45	2.45	59
MEAN	265	269	0.28	4.13	2.13	2.05	
STD DEV	265	269	0.72	1.19	0.32	0.37	
STD ERR	265	269	0.42	0.69			
	271	272	1.24	1.36	2.22	2.05	59
	273	274	-.86	5.82	2.20	2.16	59
	275	276	4.06	7.83	2.50	2.46	59
MEAN	271	275	1.48	5.01	2.31	2.23	
STD DEV	271	275	2.47	3.31	0.17	0.21	
STD ERR	271	275	1.43	1.91			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	277	278	-1.45	6.35	2.39	2.52	59
	279	280	-2.26	3.70	2.59	2.42	59
	281	282	2.86	6.52	2.33	2.36	59
MEAN	277	281	-.28	5.52	2.44	2.43	
STD DEV	277	281	2.75	1.58	0.14	0.08	
STD ERR	277	281	1.59	0.91			
	283	284	2.38	5.81	2.15	2.19	59
	285	286	-2.01	6.06	2.33	2.30	59
	287	288	0.16	8.32	2.51	2.60	59
MEAN	283	287	0.18	6.73	2.33	2.36	
STD DEV	283	287	2.20	1.38	0.18	0.21	
STD ERR	283	287	1.27	0.80			
	289	290	-2.59	6.25	2.38	2.55	59
	291	292	-1.75	1.08	2.66	2.78	59
	293	294	-1.49	3.34	2.46	2.61	59
MEAN	289	293	-1.94	3.56	2.50	2.65	
STD DEV	289	293	0.57	2.59	0.15	0.12	
STD ERR	289	293	0.33	1.49			
	295	296	-2.92	4.18	2.56	2.76	59
	297	298	-.67	7.30	2.19	2.40	59
	299	300	-.33	8.62	1.99	2.13	59
MEAN	295	299	-1.31	6.70	2.25	2.43	
STD DEV	295	299	1.41	2.28	0.29	0.32	
STD ERR	295	299	0.81	1.32			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	301	302	-2.56	3.77	2.26	2.39	59
	303	304	1.30	5.75	2.52	3.07	59
	305	306	2.06	6.28	2.32	2.60	59
MEAN	301	305	0.27	5.26	2.36	2.69	
STD DEV	301	305	2.48	1.33	0.14	0.35	
STD ERR	301	305	1.43	0.77			
	307	308	-1.20	0.66	2.19	2.59	59
	309	310	0.65	3.36	2.09	2.45	59
	311	312	-.72	6.32	2.27	2.69	59
MEAN	307	311	-.42	3.44	2.19	2.57	
STD DEV	307	311	0.96	2.83	0.09	0.12	
STD ERR	307	311	0.55	1.64			
	313	314	-3.75	6.11	2.26	2.65	59
	315	316	-1.98	8.49	2.63	3.01	59
	317	318	2.81	5.87	2.11	2.32	59
MEAN	313	317	-.97	6.83	2.33	2.66	
STD DEV	313	317	3.40	1.45	0.27	0.35	
STD ERR	313	317	1.96	0.84			
	319	320	-1.67	5.05	1.98	2.60	59
	321	322	-.57	7.02	1.82	2.19	59
	323	324	-.70	6.09	1.99	2.44	59
MEAN	319	323	-.98	6.05	1.93	2.41	
STD DEV	319	323	0.60	0.99	0.10	0.21	
STD ERR	319	323	0.35	0.57			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	325	326	-.09	5.62	2.04	2.52	59
	327	328	-.66	5.92	1.81	2.39	59
	329	330	-1.43	3.77	2.08	2.50	59
MEAN	325	329	-.72	5.10	1.97	2.47	
STD DEV	325	329	0.67	1.16	0.14	0.07	
STD ERR	325	329	0.39	0.67			
	331	332	-.38	5.56	1.93	2.38	59
	333	334	-.79	5.09	1.67	1.90	59
	335	336	0.31	4.51	1.51	1.75	59
MEAN	331	335	-.29	5.05	1.70	2.01	
STD DEV	331	335	0.55	0.53	0.21	0.33	
STD ERR	331	335	0.32	0.30			
	337	338	-.94	5.67	1.67	2.11	59
	339	340	-.19	7.11	1.84	2.26	59
	341	342	1.42	4.97	2.21	2.75	59
MEAN	337	341	0.10	5.91	1.91	2.37	
STD DEV	337	341	1.20	1.09	0.28	0.33	
STD ERR	337	341	0.70	0.63			
	343	344	-.64	7.31	1.53	1.88	59
	345	346	-2.55	8.91	1.37	1.71	59
	347	348	-1.70	7.29	1.40	1.78	59
MEAN	343	347	-1.63	7.84	1.43	1.79	
STD DEV	343	347	0.96	0.93	0.08	0.09	
STD ERR	343	347	0.55	0.54			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1967	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	349	350	-.58	5.65	1.79	2.16	59
	351	352	-1.88	6.78	1.49	1.76	59
	353	354	-.88	7.46	1.35	1.67	59
MEAN	349	353	-1.12	6.63	1.54	1.87	
STD DEV	349	353	0.68	0.91	0.23	0.26	
STD ERR	349	353	0.39	0.53			
	355	356	-.25	7.34	1.15	1.33	59
	357	358	-.33	8.23	1.35	1.54	59
	359	360	-.10	9.03	2.16	2.38	59
MEAN	355	359	-.23	8.20	1.55	1.75	
STD DEV	355	359	0.11	0.84	0.54	0.56	
STD ERR	355	359	0.07	0.49			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	1	2	-1,20	5,09	1.43	1,63	59
	3	4	0,51	8,17	1.23	1,31	59
	5	6	4,02	6,20	1.98	2,25	59
MEAN	1	5	1,11	6,49	1.55	1,73	
STD DEV	1	5	2,66	1,56	0.39	0,48	
STD ERR	1	5	1,54	0,90			
	7	8	0,42	7,95	0.97	1,04	59
	9	10	1,34	6,83	0.89	0,94	59
	11	12	0,37	7,11	1.12	1,23	59
MEAN	7	11	0,71	7,30	0.99	1,07	
STD DEV	7	11	0,54	0,58	0.12	0,15	
STD ERR	7	11	0,31	0,34			
	13	14	1,85	7,57	1.28	1,37	59
	15	16	4,42	10,83	1.60	1,65	59
	17	18	0,65	7,65	1.96	1,85	59
MEAN	13	17	2,37	8,68	1.61	1,62	
STD DEV	13	17	1,84	1,86	0.34	0,24	
STD ERR	13	17	1,06	1,07			
	19	20	1,78	8,81	1.41	1,44	59
	21	22	2,40	8,97	1.73	1,61	59
	23	24	1,93	7,48	1.49	1,44	59
MEAN	19	23	2,04	8,42	1.54	1,50	
STD DEV	19	23	0,32	0,82	0.17	0,10	
STD ERR	19	23	0,19	0,47			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	25	26	2,21	5,76	1.46	1,39	59
	27	28	2,88	7,77	1.44	1,35	59
	29	30	3,77	8,03	1.57	1,42	59
MEAN	25	29	2,95	7,19	1.49	1,38	
STD DEV	25	29	0,78	1,24	0.07	0,03	
STD ERR	25	29	0,45	0,72			
	33	34	1,67	7,15	1.60	1,44	59
	35	36	3,92	4,78	1.73	1,56	59
MEAN	33	35	2,79	5,96	1.66	1,50	
STD DEV	33	35	1,60	1,68	0.09	0,08	
STD ERR	33	35	1,13	1,19			
	37	38	4,10	10,73	1.89	1,70	59
	39	40	2,46	5,61	1.25	1,20	59
	41	42	1,56	8,12	1.32	1,18	59
MEAN	37	41	2,00	8,15	1.49	1,36	
STD DEV	37	41	2,36	2,56	0.35	0,29	
STD ERR	37	41	1,36	1,48			
	43	44	1,19	6,53	1.13	1,05	59
	45	46	0,53	6,34	1.33	1,26	59
	47	48	1,19	6,98	1.15	1,07	59
MEAN	43	47	0,97	6,62	1.20	1,13	
STD DEV	43	47	0,38	0,33	0.11	0,12	
STD ERR	43	47	0,22	0,19			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	49	50	2,92	8,32	1.35	1,29	59
	51	52	2,48	7,78	1.26	1,22	59
	53	54	0,12	7,63	1.17	1,03	59
MEAN	49	53	1,84	7,91	1.26	1,18	
STD DEV	49	53	1,50	0,36	0.09	0,14	
STD ERR	49	53	0,87	0,21			
	55	56	2,03	7,63	1.24	1,23	59
	57	58	*,26	6,93	1.04	0,93	59
	59	60	2,53	4,41	1.34	1,25	59
MEAN	55	59	1,43	6,32	1.21	1,14	
STD DEV	55	59	1,49	1,69	0.15	0,18	
STD ERR	55	59	0,86	0,98			
	61	62	2,24	10,30	1.40	1,25	59
	63	64	0,44	8,35	1.16	1,08	59
	65	66	1,47	6,60	1.20	1,16	59
MEAN	61	65	1,38	8,42	1.25	1,17	
STD DEV	61	65	0,90	1,85	0.13	0,08	
STD ERR	61	65	0,52	1,07			
	67	68	*1,39	6,05	1.32	1,27	59
	69	70	0,51	6,35	1.20	1,22	59
	71	72	2,21	7,84	1.16	1,08	59
MEAN	67	71	0,44	6,75	1.23	1,19	
STD DEV	67	71	1,80	0,96	0.08	0,10	
STD ERR	67	71	1,04	0,55			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1968	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	73	74	3,49	8,91	1.44	1,50	59
	75	76	1,28	8,33	1.17	1,09	59
	77	78	0,10	8,04	1.06	0,98	59
MEAN	73	77	1,62	8,43	1.23	1,19	
STD DEV	73	77	1,72	0,44	0.20	0,28	
STD ERR	73	77	0,99	0,25			
	79	80	0,22	6,07	1.95	1,81	59
	81	82	0,71	6,28	2.06	2,04	59
	83	84	3,95	8,65	2.09	1,99	59
MEAN	79	83	1,63	7,00	2.04	1,95	
STD DEV	79	83	2,03	1,43	0.07	0,12	
STD ERR	79	83	1,17	0,83			
	85	86	5,29	11,39	2.49	2,18	59
	87	88	4,19	6,44	1.84	1,91	59
	89	90	0,87	5,62	1.57	1,55	59
MEAN	85	89	3,45	7,82	1.96	1,88	
STD DEV	85	89	2,30	3,12	0.47	0,32	
STD ERR	85	89	1,33	1,80			
	91	92	1,11	6,09	2.07	2,13	59
	93	94	8,40	4,62	2.20	2,58	59
	95	96	5,38	9,32	2.52	2,39	59
MEAN	91	95	4,97	6,68	2.26	2,37	
STD DEV	91	95	3,66	2,40	0.23	0,23	
STD ERR	91	95	2,11	1,39			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1969	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	97	98	6,32	7,08	2.02	2,05	59
	99	100	3,75	7,54	2.01	2,13	59
	101	102	2,46	4,56	2.22	2,48	59
MEAN	97	101	4,17	6,39	2.08	2,22	
STD DEV	97	101	1,97	1,60	0.12	0,23	
STD ERR	97	101	1,14	0,92			
	103	104	2,27	8,39	2.11	2,02	59
	105	106	5,44	3,65	2.76	3,06	59
	107	108	7,55	6,75	2.17	2,39	59
MEAN	103	107	5,09	6,26	2.35	2,49	
STD DEV	103	107	2,66	2,40	0.36	0,53	
STD ERR	103	107	1,54	1,39			
	109	110	6,02	8,54	2.45	2,43	59
	111	112	5,59	5,38	2.32	2,49	59
	113	114	2,85	4,43	2.47	2,54	59
MEAN	109	113	4,82	6,12	2.41	2,49	
STD DEV	109	113	1,72	2,15	0.08	0,05	
STD ERR	109	113	0,99	1,24			
	115	116	3,85	6,70	2.55	2,98	59
	117	118	5,68	4,09	2.75	3,05	59
	119	120	4,95	6,89	2.22	2,63	59
MEAN	115	119	4,82	5,89	2.51	2,89	
STD DEV	115	119	0,92	1,57	0.27	0,23	
STD ERR	115	119	0,53	0,90			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS 1960		PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	121	122	2,35	4,62	2.40	2,70	59
	123	124	1,70	4,45	2.32	2,60	59
	125	126	5,06	8,33	2.58	3,10	59
MEAN	121	125	3,04	5,80	2.43	2,80	
STD DEV	121	125	1,78	2,19	0.14	0,26	
STD ERR	121	125	1,03	1,27			
	127	128	4,06	4,45	2.58	2,93	59
	129	130	5,97	3,55	2.73	3,00	59
	131	132	3,35	4,51	2.56	3,21	59
MEAN	127	131	3,23	4,17	2.62	3,05	
STD DEV	127	131	3,25	0,54	0.10	0,15	
STD ERR	127	131	1,87	0,31			
	133	134	0,27	6,06	2.56	2,95	59
	135	136	4,22	5,30	2.01	2,75	59
	137	138	3,12	-1,94	2.76	3,39	59
MEAN	133	137	2,54	3,14	2.44	3,03	
STD DEV	133	137	2,04	4,41	0.39	0,33	
STD ERR	133	137	1,18	2,55			
	139	140	6,16	1,60	2.36	2,74	59
	141	142	5,01	2,66	2.15	2,63	59
	143	144	4,92	2,44	2.63	2,96	59
MEAN	139	143	5,36	2,23	2.38	2,78	
STD DEV	139	143	0,69	0,56	0.24	0,17	
STD ERR	139	143	0,40	0,32			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1968	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	145	146	8,05	1,82	2.85	3,67	59
	147	148	2,19	5,09	0.90	1,09	59
	149	150	6,41	5,21	1.29	1,59	59
MEAN	145	149	5,55	4,04	1.68	2,12	
STD DEV	145	149	3,02	1,92	1.03	1,37	
STD ERR	145	149	1,75	1,11			
	151	152	4,80	7,47	1.08	1,30	59
	153	154	4,49	5,70	0.90	1,13	59
	155	156	3,87	4,96	1.35	1,56	59
MEAN	151	155	4,39	6,04	1.11	1,33	
STD DEV	151	155	0,47	1,29	0.23	0,22	
STD ERR	151	155	0,27	0,74			
	157	158	3,74	6,19	0.95	1,23	59
	159	160	3,71	5,20	0.97	1,18	59
	161	162	3,86	5,38	1.08	1,33	59
MEAN	157	161	3,77	5,59	1.00	1,25	
STD DEV	157	161	0,08	0,53	0.07	0,07	
STD ERR	157	161	0,05	0,30			
	163	164	2,77	5,59	1.10	1,28	59
	165	166	4,72	5,00	1.06	1,28	59
	167	168	1,91	4,35	0.95	1,16	59
MEAN	163	167	3,13	4,98	1.04	1,24	
STD DEV	163	167	1,44	0,62	0.08	0,07	
STD ERR	163	167	0,83	0,36			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1968	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	169	170	2,28	5,03	0.97	1,09	59
	171	172	2,39	5,77	1.11	1,33	59
	173	174	2,35	4,93	0.92	1,24	59
MEAN	169	173	2,34	5,24	1.00	1,22	
STD DEV	169	173	0,06	0,46	0.10	0,12	
STD ERR	169	173	0,03	0,26			
	175	176	2,16	5,40	0,97	1,12	59
	177	178	3,83	4,07	0,93	1,03	59
	179	180	2,56	4,74	0,89	1,08	59
MEAN	175	179	2,85	4,74	0,93	1,07	
STD DEV	175	179	0,87	0,67	0.04	0,05	
STD ERR	175	179	0,50	0,38			
	181	182	3,78	5,21	0.88	1,01	59
	183	184	4,18	4,63	0.94	1,04	59
	185	186	3,80	4,59	1.08	1,27	59
MEAN	181	185	3,92	4,81	0,96	1,11	
STD DEV	181	185	0,23	0,35	0.10	0,14	
STD ERR	181	185	0,13	0,20			
	187	188	3,60	3,90	0.91	1,02	59
	189	190	3,22	4,31	0.80	0,92	59
	191	192	2,75	2,32	0.98	1,06	59
MEAN	187	191	3,19	3,51	0,90	1,00	
STD DEV	187	191	0,43	1,05	0.09	0,07	
STD ERR	187	191	0,25	0,61			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1968	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	193	194	4,72	3,29	0.86	0,91	59
	195	196	3,41	3,56	0.83	0,88	59
	197	198	3,63	4,98	0.80	0,85	59
MEAN	193	197	3,92	3,95	0.83	0,88	
STD DEV	193	197	0,70	0,91	0.03	0,03	
STD ERR	193	197	0,40	0,52			
	199	200	4,04	4,75	0.94	1,01	59
	201	202	4,33	3,44	0.86	0,88	59
	203	204	4,38	3,14	0.94	0,95	59
MEAN	199	203	4,25	3,78	0.91	0,94	
STD DEV	199	203	0,18	0,85	0.04	0,06	
STD ERR	199	203	0,10	0,49			
	205	206	5,55	4,86	1.05	1,07	59
	207	208	3,57	3,57	0.99	0,92	59
	209	210	4,07	4,34	0.93	0,96	59
MEAN	205	209	4,40	4,26	0.99	0,98	
STD DEV	205	209	1,03	0,65	0.06	0,07	
STD ERR	205	209	0,60	0,38			
	211	212	3,07	2,98	1.02	1,01	59
	213	214	3,08	3,60	0.94	0,97	59
	215	216	4,89	0,66	0.93	0,91	59
MEAN	211	215	3,68	2,42	0.96	0,96	
STD DEV	211	215	1,05	1,55	0.05	0,05	
STD ERR	211	215	0,61	0,90			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	POLE PØSITIØN X METERS	POLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	217	218	5,09	1,91	1.18	1,13	59
	219	220	2,45	1,98	1.06	1.01	59
	221	222	2,28	3,76	1.08	1,06	59
MEAN	217	221	3,27	2,55	1.11	1,07	
STD DEV	217	221	1,58	1,05	0.07	0,06	
STD ERR	217	221	0,91	0,61			
	223	224	2,04	1,21	0.98	0,92	59
	225	226	2,88	2,48	1.09	1,02	59
	227	228	3,28	3,23	0.86	0,86	59
MEAN	223	227	2,73	2,30	0.98	0,94	
STD DEV	223	227	0,63	1,02	0,11	0,08	
STD ERR	223	227	0,36	0,59			
	229	230	3,00	1,75	1.24	1,04	59
	231	232	2,12	0,53	1.11	1,07	59
	233	234	2,11	2,61	0.89	0,84	59
MEAN	229	233	2,41	1,63	1.08	0,98	
STD DEV	229	233	0,51	1,05	0.18	0,13	
STD ERR	229	233	0,30	0,60			
	235	236	2,47	1,35	0.99	0,95	59
	237	238	3,73	2,08	0.95	0,87	59
	239	240	3,71	3,11	0.92	0,88	59
MEAN	235	239	3,30	2,18	0.95	0,90	
STD DEV	235	239	0,72	0,89	0.03	0,04	
STD ERR	235	239	0,42	0,51			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	241	242	2,93	3,52	0.97	0,97	59
	243	244	4,02	2,41	0.99	0,99	59
	245	246	2,41	0,79	0.98	0,93	59
MEAN	241	245	3,12	2,24	0.98	0,96	
STD DEV	241	245	0,82	1,37	0.01	0,03	
STD ERR	241	245	0,47	0,79			
	247	248	1,78	3,60	0.91	0,87	59
	249	250	1,98	1,59	0.98	0,99	59
	251	252	3,35	2,56	1,02	1,02	59
MEAN	247	251	2,37	2,58	0.97	0,96	
STD DEV	247	251	0,86	1,00	0.06	0,08	
STD ERR	247	251	0,49	0,58			
	253	254	1,91	2,50	0.94	0,91	59
	255	256	0,90	2,80	0.96	0,96	59
	257	258	1,55	1,66	0.91	0,88	59
MEAN	253	257	1,45	2,32	0.94	0,92	
STD DEV	253	257	0,51	0,59	0.03	0,04	
STD ERR	253	257	0,30	0,34			
	259	260	2,59	0,63	1.02	0,99	59
	261	262	1,30	0,10	1.05	1,12	59
	263	264	3,00	2,04	0.89	0,95	59
MEAN	259	263	2,30	0,92	0.99	1,02	
STD DEV	259	263	0,89	1,00	0.08	0,09	
STD ERR	259	263	0,51	0,58			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	265	266	0,91	2,33	0.97	1,12	59
	267	268	-,68	2,26	1.16	1,30	59
	269	270	0,66	0,32	1.10	1,11	59
MEAN	265	269	0,30	1,64	1.08	1,18	
STD DEV	265	269	0,86	1,14	0.09	0,11	
STD ERR	265	269	0,49	0,66			
	271	272	-,10	-,37	0.92	1,01	59
	273	274	-1,56	1,52	0.98	1,11	59
	275	276	2,81	2,92	0.85	0,92	59
MEAN	271	275	0,39	1,36	0.92	1,02	
STD DEV	271	275	2,23	1,65	0.06	0,10	
STD ERR	271	275	1,29	0,96			
	277	278	-1,65	2,82	1.26	1,39	59
	279	280	-3,32	2,65	1.03	1,16	59
	281	282	0,19	2,25	1.07	1,29	59
MEAN	277	281	-1,59	2,57	1.12	1,28	
STD DEV	277	281	1,76	0,29	0.12	0,12	
STD ERR	277	281	1,01	0,17			
	283	284	0,41	2,85	0.98	1,25	59
	285	286	0,96	3,95	1.00	1,45	59
	287	288	0,30	1,48	1.07	1,45	59
MEAN	283	287	0,56	2,76	1.02	1,38	
STD DEV	283	287	0,35	1,24	0.05	0,12	
STD ERR	283	287	0,20	0,72			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	Y METERS	STANDARD ERRØR X METERS	Y METERS	SATELLITE
	289	290	-,68	3,23	1.05	1,30	59
	291	292	-3,83	1,90	1.06	1,23	59
	293	294	-,15	3,33	0.97	1,11	59
MEAN	289	293	-1,56	2,82	1.03	1,21	
STD DEV	289	293	1,99	0,80	0.05	0,10	
STD ERR	289	293	1,15	0,46			
	295	296	-,40	2,62	1.06	1,25	59
	297	298	0,82	0,62	1.27	1,83	59
	299	300	0,53	6,34	0.99	1,51	59
MEAN	295	299	0,32	3,19	1.11	1,53	
STD DEV	295	299	0,63	2,90	0.15	0,29	
STD ERR	295	299	0,37	1,68			
	301	302	-2,60	4,28	1.05	1,49	59
	303	304	-2,36	-1,98	1.23	1,77	59
	305	306	-2,09	-3,02	0.93	1,39	59
MEAN	301	305	-2,35	-,24	1.07	1,55	
STD DEV	301	305	0,25	3,95	0.15	0,20	
STD ERR	301	305	0,15	2,28			
	307	308	-,29	0,56	1.27	1,60	59
	309	310	-1,87	1,37	1.06	1,26	59
	311	312	-,43	3,86	0.93	1,25	59
MEAN	307	311	-,86	1,93	1.09	1,37	
STD DEV	307	311	0,88	1,72	0.17	0,20	
STD ERR	307	311	0,51	0,99			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1968	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	313	314	-,91	1,91	0.91	1,15	59
	315	316	-2,57	-,55	1.05	1.36	59
	317	318	-1,96	3,04	0.89	1,18	59
MEAN	313	317	-1,81	1,47	0.95	1,23	
STD DEV	313	317	0,84	1,83	0.09	0,12	
STD ERR	313	317	0,48	1,06			
	319	320	-1,16	4,15	1.07	1,34	59
	321	322	-1,60	3,58	0.86	1,09	59
	323	324	-2,03	2,05	0.93	1,17	59
MEAN	319	323	-1,60	3,26	0.95	1,20	
STD DEV	319	323	0,43	1,09	0.11	0,13	
STD ERR	319	323	0,25	0,63			
	325	326	0,98	-,83	0.88	1,07	59
	327	328	-2,86	-,32	0.95	1,19	59
	329	330	-1,86	3,76	0.88	1,03	59
MEAN	325	329	-1,25	0,87	0.90	1,10	
STD DEV	325	329	1,99	2,52	0.04	0,09	
STD ERR	325	329	1,15	1,45			
	331	332	-2,74	3,25	1.11	1,37	59
	333	334	-2,98	5,90	0.88	1,09	59
	335	336	-4,29	5,13	1.28	1,32	59
MEAN	331	335	-3,34	4,76	1.09	1,26	
STD DEV	331	335	0,83	1,36	0.20	0,15	
STD ERR	331	335	0,48	0,79			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1969	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	337	338	-3,53	1,35	1.11	1,34	59
	339	340	-4,19	1,62	1.19	1,41	59
	341	342	-3,18	4,99	1.24	1,37	59
MEAN	337	341	-3,63	2,65	1.18	1,38	
STD DEV	337	341	0,51	2,03	0.07	0,04	
STD ERR	337	341	0,29	1,17			
	343	344	-2,15	6,21	1.39	1,54	59
	345	346	-2,63	5,43	1.09	1,23	59
	347	348	-2,83	5,56	1.19	1,36	59
MEAN	343	347	-2,54	5,74	1.22	1,38	
STD DEV	343	347	0,35	0,42	0.15	0,16	
STD ERR	343	347	0,20	0,24			
	349	350	-2,66	3,86	1.13	1,29	59
	351	352	-,99	3,85	1.06	1,10	59
	353	354	-1,94	5,10	0.87	0,98	59
MEAN	349	353	-1,87	4,27	1.02	1,12	
STD DEV	349	353	0,84	0,72	0.13	0,16	
STD ERR	349	353	0,48	0,42			
	355	356	-4,37	5,01	0.99	1,08	59
	357	358	-1,68	6,79	1.05	1,11	59
	359	360	-1,54	5,32	1.32	1,47	59
MEAN	355	359	-2,53	5,71	1.12	1,22	
STD DEV	355	359	1,59	0,95	0.17	0,22	
STD ERR	355	359	0,92	0,55			
	361	362	-2,40	5,98	1.14	1,18	59
	363	364	-2,50	5,92	0.98	0,98	59
MEAN	361	363	-2,45	5,95	1.06	1,08	
STD DEV	361	363	0,07	0,04	0.11	0,14	
STD ERR	361	363	0,05	0,03			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	15	16	-5.24	6.20	1.14	1.05	59
	16	17	-3.74	5.77	1.52	1.66	60
	17	18	-2.88	6.99	0.95	0.90	59
	18	19	-3.78	9.38	1.17	1.26	60
MEAN	15	18	-3.91	7.08	1.19	1.22	
STD DEV	15	18	0.98	1.61	0.24	0.33	
STD ERR	15	18	0.49	0.81			
	19	20	-.29	5.52	1.00	0.96	59
	20	21	-5.85	4.45	1.14	1.27	60
	21	22	-5.98	7.19	1.19	1.21	59
	22	23	-3.17	9.46	1.17	1.25	60
	23	24	-1.11	8.95	1.12	1.16	59
	24	25	-2.04	7.05	1.20	1.26	60
MEAN	19	24	-3.07	7.10	1.14	1.18	
STD DEV	19	24	2.40	1.92	0.07	0.12	
STD ERR	19	24	0.98	0.79			
	25	26	-1.14	4.96	1.01	1.06	59
	26	27	-2.56	7.64	1.06	1.15	60
	27	28	-4.25	7.42	1.33	1.36	59
	28	29	-5.58	6.76	1.43	1.43	60
	29	30	-5.19	7.82	1.17	1.14	59
	30	31	-6.44	4.28	1.26	1.44	60
MEAN	25	30	-4.19	6.48	1.21	1.26	
STD DEV	25	30	2.00	1.50	0.16	0.17	
STD ERR	25	30	0.82	0.61			
	31	32	-2.14	6.77	0.89	0.89	59
	32	33	-4.18	4.50	1.34	1.54	60
	33	34	0.27	10.06	1.29	1.27	59
	34	35	-3.14	7.71	1.14	1.26	60
	35	36	-1.20	8.80	0.97	0.95	59
	36	37	-2.80	7.18	1.17	1.33	60
MEAN	31	36	-2.20	7.50	1.13	1.21	
STD DEV	31	36	1.57	1.89	0.18	0.24	
STD ERR	31	36	0.64	0.77			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	37	38	-.43	10.27	1.72	1.72	59
	38	39	-3.42	8.62	1.38	1.54	60
	39	40	-1.51	9.44	1.47	1.51	59
	40	41	-2.73	8.77	1.31	1.58	60
	41	42	-3.57	6.56	1.26	1.33	59
	42	43	-3.05	5.70	1.51	1.67	60
MEAN	37	42	-2.45	8.23	1.44	1.56	
STD DEV	37	42	1.23	1.75	0.17	0.14	
STD ERR	37	42	0.50	0.71			
	43	44	-2.56	8.22	1.20	1.27	59
	44	45	-3.01	5.93	1.43	1.63	60
	45	46	-.95	7.48	1.17	1.19	59
	46	47	-4.49	7.75	1.21	1.39	60
	47	48	-1.43	7.75	1.31	1.24	59
	48	49	-5.17	8.47	1.35	1.52	60
MEAN	43	48	-2.93	7.60	1.28	1.37	
STD DEV	43	48	1.66	0.89	0.10	0.17	
STD ERR	43	48	0.68	0.36			
	49	50	-3.71	7.51	1.32	1.32	59
	50	51	-.61	9.79	1.49	1.73	60
	51	52	-2.56	7.84	1.14	1.06	59
	52	53	-2.83	7.12	1.70	2.04	60
	53	54	-1.45	5.13	1.09	0.98	59
	54	55	-2.17	5.23	1.46	1.85	60
MEAN	49	54	-2.22	7.10	1.37	1.50	
STD DEV	49	54	1.09	1.75	0.23	0.44	
STD ERR	49	54	0.44	0.71			
	55	56	-1.00	6.63	1.12	1.17	59
	56	57	0.51	7.73	1.68	1.85	60
	57	58	-4.89	7.28	1.11	1.05	59
	58	59	-.45	6.26	1.51	1.70	60
	59	60	-1.79	6.97	1.43	1.53	59
	60	61	-2.28	7.12	1.73	1.91	60
MEAN	55	60	-1.65	7.00	1.43	1.53	
STD DEV	55	60	1.87	0.51	0.27	0.36	
STD ERR	55	60	0.76	0.21			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	61	62	-1.26	10.06	1.58	1.65	59
	62	63	-3.12	6.70	1.17	1.24	60
	63	64	-3.77	7.97	1.44	1.53	59
	64	65	-6.64	6.15	3.03	4.68	60
	65	66	-1.53	7.09	1.39	1.48	59
	66	67	-1.58	9.43	1.41	1.66	60
MEAN	61	66	-2.98	7.90	1.67	2.04	
STD DEV	61	66	2.05	1.56	0.68	1.30	
STD ERR	61	66	0.84	0.64			
	67	68	-1.79	7.09	1.08	1.12	59
	68	69	-1.78	9.22	1.26	1.46	60
	69	70	-.03	9.73	1.49	1.51	59
	70	71	-1.45	8.51	1.29	1.53	60
	71	72	-.06	10.68	1.28	1.33	59
	72	73	-.21	7.98	1.40	1.68	60
MEAN	67	72	-.89	8.87	1.30	1.44	
STD DEV	67	72	0.87	1.28	0.14	0.19	
STD ERR	67	72	0.36	0.52			
	74	75	2.03	11.69	1.75	1.96	60
	75	76	-2.94	9.11	1.22	1.30	59
	76	77	-.11	11.12	1.39	1.60	60
	77	78	-3.15	12.40	1.69	1.83	59
	78	79	-3.38	11.71	1.71	1.94	60
MEAN	74	78	-1.51	11.21	1.55	1.73	
STD DEV	74	78	2.38	1.26	0.23	0.28	
STD ERR	74	78	1.07	0.56			
	79	80	-1.48	9.41	1.72	1.80	59
	80	81	-.14	7.73	1.43	1.53	60
	81	82	-.11	10.23	1.22	1.36	59
	82	83	2.57	17.17	1.76	1.94	60
	83	84	3.61	8.23	1.17	1.38	59
	84	85	0.26	7.62	1.56	1.61	60
MEAN	79	84	0.78	10.06	1.48	1.60	
STD DEV	79	84	1.91	3.63	0.25	0.23	
STD ERR	79	84	0.78	1.48			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	85	86	1.00	10.17	1.47	1.69	59
	86	87	-.93	10.70	1.15	1.28	60
	87	88	-1.52	11.01	1.37	1.60	59
	88	89	0.25	8.26	1.47	1.66	60
	89	90	-.67	9.75	1.32	1.62	59
	90	91	-1.27	10.11	1.89	2.01	60
MEAN	85	90	-.52	10.00	1.44	1.64	
STD DEV	85	90	0.97	0.96	0.25	0.23	
STD ERR	85	90	0.39	0.39			
	91	92	-1.61	13.40	1.80	2.89	59
	92	93	1.31	11.61	1.14	1.27	60
	93	94	1.44	11.61	1.16	1.32	59
	94	95	-.14	7.94	1.27	1.33	60
	95	96	1.28	12.55	1.24	1.39	59
	96	97	-.55	11.55	1.48	1.63	60
MEAN	91	96	0.29	11.44	1.35	1.64	
STD DEV	91	96	1.25	1.87	0.25	0.63	
STD ERR	91	96	0.51	0.76			
	97	98	1.67	12.08	1.30	1.60	59
	98	99	0.97	11.30	1.51	1.69	60
	99	100	-.49	10.43	1.19	1.30	59
	100	101	0.13	10.18	1.05	1.15	60
	101	102	2.07	8.42	1.05	1.20	59
	102	103	0.99	11.04	1.28	1.38	60
MEAN	97	102	0.89	10.57	1.23	1.39	
STD DEV	97	102	0.95	1.25	0.17	0.22	
STD ERR	97	102	0.39	0.51			
	103	104	1.08	9.65	1.11	1.21	59
	104	105	0.33	10.32	1.04	1.16	60
	105	106	2.84	9.82	1.35	1.44	59
	106	107	-1.05	10.77	1.11	1.19	60
	107	108	1.62	10.76	0.95	1.04	59
	108	109	2.10	10.98	1.16	1.22	60
MEAN	103	108	1.15	10.38	1.12	1.21	
STD DEV	103	108	1.38	0.55	0.13	0.13	
STD ERR	103	108	0.56	0.22			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	109	110	0.97	12.05	1.36	1.61	59
	110	111	1.28	8.53	1.18	1.25	60
	111	112	-.59	9.76	1.14	1.42	59
	112	113	2.95	8.25	1.26	1.40	60
	113	114	2.09	11.97	1.37	1.51	59
	114	115	2.58	9.59	1.01	1.07	60
MEAN	109	114	1.55	10.02	1.22	1.38	
STD DEV	109	114	1.29	1.64	0.14	0.19	
STD ERR	109	114	0.53	0.67			
	115	116	1.42	11.21	1.14	1.26	59
	116	117	2.17	10.37	1.55	1.66	60
	117	118	2.16	9.28	1.10	1.25	59
	118	119	2.71	9.52	1.06	1.05	60
	119	120	0.73	4.67	1.51	2.49	59
	120	121	3.75	12.40	1.16	1.25	60
MEAN	115	120	2.16	9.57	1.25	1.49	
STD DEV	115	120	1.04	2.66	0.22	0.53	
STD ERR	115	120	0.43	1.09			
	121	122	-.63	10.34	1.20	1.41	59
	122	123	2.36	10.00	1.05	1.03	60
	123	124	1.97	14.34	1.51	1.74	59
	124	125	2.54	10.03	1.39	1.29	60
	125	126	5.67	13.10	1.41	1.72	59
	126	127	2.02	9.54	1.32	1.37	60
MEAN	121	126	2.32	11.22	1.31	1.43	
STD DEV	121	126	2.01	1.99	0.17	0.27	
STD ERR	121	126	0.82	0.81			
	127	128	2.28	8.80	1.30	1.69	59
	128	129	2.45	9.14	0.90	0.93	60
	129	130	2.75	11.39	1.12	1.34	59
	130	131	4.96	9.70	1.00	1.09	60
	131	132	2.26	13.44	1.24	1.47	59
	132	133	5.21	8.19	1.10	1.14	60
MEAN	127	132	3.32	10.11	1.11	1.28	
STD DEV	127	132	1.38	1.96	0.15	0.28	
STD ERR	127	132	0.56	0.80			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	133	134	2.49	9.70	1.36	1.71	59
	134	135	2.31	11.33	0.97	0.98	60
	135	136	1.86	12.11	1.24	1.43	59
	136	137	3.92	10.73	1.03	1.09	60
	137	138	4.28	12.39	1.54	1.78	59
	138	139	5.03	9.58	0.84	0.87	60
MEAN	133	138	3.31	10.97	1.16	1.31	
STD DEV	133	138	1.27	1.19	0.26	0.39	
STD ERR	133	138	0.52	0.48			
	139	140	3.21	11.97	1.14	1.29	59
	140	141	3.38	9.92	1.04	1.05	60
	141	142	2.73	10.90	1.00	1.20	59
	142	143	3.68	9.49	1.09	1.06	60
	143	144	1.17	9.18	0.94	1.09	59
	144	145	4.63	7.86	0.96	0.96	60
MEAN	139	144	3.13	9.89	1.03	1.11	
STD DEV	139	144	1.15	1.42	0.08	0.12	
STD ERR	139	144	0.47	0.58			
	145	146	3.58	9.14	1.12	1.24	59
	146	147	6.61	7.94	0.99	0.99	60
	147	148	3.10	10.19	1.19	1.26	59
	148	149	4.53	8.52	1.00	1.04	60
	150	151	6.78	9.13	1.01	1.04	60
MEAN	145	150	4.92	8.98	1.06	1.11	
STD DEV	145	150	1.70	0.84	0.09	0.13	
STD ERR	145	150	0.76	0.37			
	151	152	3.52	9.24	0.98	1.09	59
	152	153	4.92	7.09	0.93	0.94	60
	153	154	4.63	9.69	0.92	1.06	59
	154	155	4.05	7.15	0.98	0.96	60
	155	156	2.62	7.88	0.93	1.05	59
	156	157	5.19	8.90	0.93	0.95	60
MEAN	151	156	4.15	8.32	0.94	1.01	
STD DEV	151	156	0.96	1.11	0.03	0.07	
STD ERR	151	156	0.39	0.45			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	157	158	3.11	9.04	1.08	1.28	59
	158	159	3.91	8.53	1.06	1.08	60
	159	160	3.24	8.49	1.01	1.18	59
	160	161	5.10	8.73	1.04	1.08	60
	161	162	6.20	9.69	1.44	1.69	59
	162	163	2.52	8.07	1.08	1.07	60
MEAN	157	162	4.01	8.76	1.12	1.23	
STD DEV	157	162	1.39	0.56	0.16	0.24	
STD ERR	157	162	0.57	0.23			
	163	164	3.07	7.66	1.06	1.22	59
	164	165	4.72	6.34	1.24	1.22	60
	165	166	3.92	8.88	1.04	1.18	59
	166	167	5.96	8.03	1.28	1.22	60
	167	168	3.99	9.98	1.46	1.59	59
	168	169	4.72	6.65	1.03	1.06	60
MEAN	163	168	4.40	7.92	1.18	1.25	
STD DEV	163	168	0.98	1.37	0.17	0.18	
STD ERR	163	168	0.40	0.56			
	169	170	4.68	8.28	1.28	1.34	59
	170	171	4.94	7.47	0.97	0.97	60
	171	172	6.12	8.14	1.02	1.17	59
	172	173	5.16	8.14	1.17	1.17	60
	173	174	6.01	7.86	1.05	1.21	59
	174	175	3.41	10.75	1.27	1.26	60
MEAN	169	174	5.05	8.44	1.13	1.19	
STD DEV	169	174	0.99	1.17	0.13	0.12	
STD ERR	169	174	0.40	0.48			
	175	176	4.84	9.68	0.98	1.09	59
	176	177	5.51	6.74	0.89	0.89	60
	177	178	3.99	8.91	1.19	1.34	59
	178	179	3.21	9.03	1.10	1.10	60
	179	180	5.02	10.29	1.16	1.23	59
	180	181	4.76	7.41	1.01	1.02	60
MEAN	175	180	4.55	8.68	1.05	1.11	
STD DEV	175	180	0.82	1.35	0.12	0.16	
STD ERR	175	180	0.34	0.55			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	181	182	6.80	8.02	1.10	1.14	59
	182	183	6.46	9.43	1.25	1.35	60
	183	184	6.76	7.49	1.13	1.21	59
	184	185	5.06	6.46	1.09	1.14	60
	185	186	7.83	7.45	1.06	1.10	59
	186	187	7.54	6.29	1.13	1.20	60
MEAN	181	186	6.74	7.52	1.13	1.19	
STD DEV	181	186	0.97	1.14	0.07	0.09	
STD ERR	181	186	0.40	0.47			
	187	188	4.14	6.14	1.01	1.04	59
	188	189	6.46	7.82	1.05	1.09	60
	189	190	3.97	7.89	1.11	1.14	59
	190	191	6.00	6.71	1.04	1.10	60
	191	192	4.94	7.02	1.10	1.14	59
	192	193	5.12	6.96	1.14	1.20	60
MEAN	187	192	5.10	7.09	1.07	1.12	
STD DEV	187	192	0.99	0.67	0.05	0.05	
STD ERR	187	192	0.40	0.27			
	193	194	4.70	5.38	1.15	1.22	59
	194	195	4.65	4.50	1.02	1.07	60
	195	196	4.99	5.46	1.55	1.61	59
	196	197	5.76	4.38	1.33	1.39	60
	197	198	4.76	4.91	1.17	1.21	59
	198	199	5.98	5.58	1.05	1.19	60
MEAN	193	198	5.14	5.03	1.21	1.28	
STD DEV	193	198	0.58	0.52	0.20	0.19	
STD ERR	193	198	0.24	0.21			
	199	200	4.33	5.39	1.02	1.01	59
	200	201	5.62	5.20	0.98	1.08	60
	201	202	4.61	5.56	1.09	1.15	59
	202	203	3.11	7.31	1.42	2.32	60
	203	204	5.56	5.66	1.04	0.95	59
	204	205	5.87	5.44	0.93	1.05	60
MEAN	199	204	4.85	5.76	1.08	1.26	
STD DEV	199	204	1.05	0.78	0.18	0.52	
STD ERR	199	204	0.43	0.32			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	205	206	6.04	5.54	1.06	1.09	59
	206	207	6.52	5.40	0.96	0.97	60
	207	208	7.80	5.50	1.03	0.99	59
	209	210	5.69	4.38	1.01	0.97	59
	210	211	7.12	2.55	1.06	1.20	60
MEAN	205	210	6.63	4.67	1.00	1.04	
STD DEV	205	210	0.84	1.28	0.08	0.10	
STD ERR	205	210	0.38	0.57			
	211	212	4.08	7.02	0.97	0.93	59
	212	213	5.97	4.81	0.95	1.05	60
	213	214	7.16	7.91	1.06	1.04	59
	214	215	5.23	3.93	1.15	1.28	60
	215	216	6.20	5.12	0.96	1.00	59
	216	217	4.55	6.12	1.09	1.18	60
MEAN	211	216	5.53	5.82	1.03	1.08	
STD DEV	211	216	1.14	1.48	0.09	0.13	
STD ERR	211	216	0.46	0.60			
	217	218	6.56	4.76	0.92	0.93	59
	218	219	5.51	6.14	1.10	1.28	60
	219	220	7.29	2.51	1.05	1.08	59
	220	221	4.16	4.34	1.20	1.41	60
	221	222	7.44	5.52	0.99	1.02	59
	222	223	5.91	3.26	1.00	1.20	60
MEAN	217	222	6.14	4.42	1.04	1.15	
STD DEV	217	222	1.23	1.36	0.10	0.18	
STD ERR	217	222	0.50	0.56			
	223	224	4.44	4.89	1.01	1.04	59
	224	225	6.28	4.23	1.03	1.21	60
	225	226	4.05	3.21	0.92	0.96	59
	226	227	5.30	3.43	1.14	1.28	60
	227	228	3.77	4.11	1.11	1.13	59
	228	229	5.26	3.19	0.96	0.95	60
MEAN	223	228	4.85	3.84	1.01	1.09	
STD DEV	223	228	0.94	0.58	0.11	0.13	
STD ERR	223	228	0.38	0.28			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1969	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	229	230	5,14	4,52	0.92	0.99	59
	230	231	6,52	2,69	0.95	1.05	60
	231	232	6,71	2,48	1.06	1.11	59
	232	233	5,52	3,35	1.00	1.12	60
	233	234	4,92	5,19	0.98	1.06	59
	234	235	5,09	4,29	1.11	1.27	60
MEAN	229	234	5,65	3,75	1.00	1.10	
STD DEV	229	234	0,78	1,08	0.07	0,10	
STD ERR	229	234	0,32	0,44			
	235	236	3,51	-,21	1.34	1,63	59
	236	237	4,93	5,27	1.40	1.60	60
	237	238	4,52	2,96	1.03	1,09	59
	238	239	2,33	-,96	1.63	2.83	60
	239	240	6,71	3,21	1.13	1.19	59
	240	241	5,55	4,87	1.23	1,46	60
MEAN	235	240	4,59	2,52	1.29	1,63	
STD DEV	235	240	1,54	2,58	0.21	0,63	
STD ERR	235	240	0,63	1,05			
	241	242	5,29	5,04	0.91	0,89	59
	242	243	3,22	3,69	1.11	1.27	60
	243	244	4,02	7,00	2.37	2.41	59
	244	245	4,00	3,40	2.10	3.65	60
	245	246	6,20	2,50	0.99	1.06	59
	246	247	8,30	5,42	2.87	3.36	60
MEAN	241	246	5,17	4,51	1.72	2.11	
STD DEV	241	246	1,86	1,63	0.83	1.21	
STD ERR	241	246	0,76	0,66			
	247	248	2,54	1,24	1.32	1,40	59
	248	249	5,58	2,80	0.87	0.99	60
	249	250	4,94	1,03	1.04	1.12	59
	250	251	2,52	3,28	1.10	1.22	60
	251	252	3,37	1,81	1.02	1,06	59
	252	253	2,94	4,95	0.90	1.02	60
MEAN	247	252	3,65	2,52	1.04	1,13	
STD DEV	247	252	1,30	1,48	0.16	0,15	
STD ERR	247	252	0,53	0,60			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1969	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	253	254	4.88	3.43	0.95	1.03	59
	254	255	3.96	3.12	1.07	1.18	60
	255	256	6.78	4.63	1.03	1.14	59
	256	257	3.88	1.43	1.02	1.20	60
	257	258	3.10	1.48	0.96	1.06	59
	258	259	4.89	1.29	1.03	1.18	60
MEAN	253	258	4.58	2.56	1.01	1.13	
STD DEV	253	258	1.27	1.37	0.05	0.07	
STD ERR	253	258	0.52	0.56			
	259	260	1.04	2.77	1.30	1.32	59
	261	262	3.16	2.42	1.10	1.23	59
	262	263	7.50	0.57	1.16	1.30	60
	263	264	2.53	2.90	1.18	1.29	59
	264	265	6.12	2.81	1.15	1.30	60
MEAN	259	264	4.07	2.29	1.18	1.29	
STD DEV	259	264	2.66	0.98	0.07	0.03	
STD ERR	259	264	1.19	0.44			
	265	266	3.99	2.26	1.20	1.29	59
	266	267	3.96	0.69	1.26	1.38	60
	267	268	3.94	2.45	1.08	1.20	59
	268	269	4.72	2.86	1.32	1.52	60
	269	270	1.48	-1.28	1.38	1.53	59
	270	271	5.01	-1.23	1.39	1.60	60
MEAN	265	270	3.35	0.96	1.27	1.42	
STD DEV	265	270	1.25	1.87	0.12	0.16	
STD ERR	265	270	0.51	0.76			
	271	272	-.79	0.67	1.09	1.23	59
	272	273	2.76	3.82	1.22	1.30	60
	273	274	2.91	1.40	1.14	1.21	59
	274	275	3.62	2.03	1.15	1.23	60
	275	276	2.11	2.02	1.06	1.13	59
	276	277	3.55	-.56	1.07	1.15	60
MEAN	271	276	2.36	1.56	1.12	1.21	
STD DEV	271	276	1.64	1.47	0.06	0.06	
STD ERR	271	276	0.67	0.60			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS 1969		POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	278	279	3.25	0.83	1.05	1.06	60
	280	281	5.23	-.02	0.78	0.87	60
	282	283	4.91	2.44	0.91	1.07	60
MEAN	278	282	4.46	1.08	0.91	1.00	
STD DEV	278	282	1.06	1.25	0.14	0.11	
STD ERR	278	282	0.61	0.72			
	284	285	2.45	1.19	0.95	0.99	60
	286	287	1.39	0.67	0.81	0.84	60
	288	289	2.30	1.97	0.88	0.94	60
MEAN	284	288	2.05	1.28	0.88	0.92	
STD DEV	284	288	0.57	0.65	0.07	0.08	
STD ERR	284	288	0.33	0.38			
	290	291	3.24	0.62	0.82	0.89	60
	292	293	1.78	-.29	0.83	0.93	60
	294	295	2.82	0.02	0.90	0.97	60
MEAN	290	294	2.61	0.12	0.85	0.93	
STD DEV	290	294	0.75	0.46	0.04	0.04	
STD ERR	290	294	0.43	0.27			
	296	297	3.79	0.11	0.87	0.92	60
	298	299	4.09	-.74	1.00	0.99	60
	300	301	2.28	0.74	0.91	0.87	60
MEAN	296	300	3.39	0.04	0.93	0.93	
STD DEV	296	300	0.97	0.74	0.07	0.06	
STD ERR	296	300	0.56	0.43			

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DAHLGREN PØLAR MØNITØRING SERVICE

	DAYS	1969	PØLE PØSITIØN X METERS	PØLE PØSITIØN Y METERS	STANDARD ERRØR X METERS	STANDARD ERRØR Y METERS	SATELLITE
	302	303	0,31	-,05	1.00	0.94	60
	304	305	-,70	-,99	0.85	0.88	60
	306	307	1,80	0,07	0.94	0.90	60
MEAN	302	306	0,47	-,32	0.93	0.91	
STD DEV	302	306	1,26	0,58	0.08	0,03	
STD ERR	302	306	0,73	0,34			
	308	309	2,50	-,43	0.90	0.82	60
	310	311	1,16	0,15	0.95	0,89	60
	312	313	1,24	0,82	0.95	0,90	60
MEAN	308	312	1,64	0,18	0.93	0.87	
STD DEV	308	312	0,75	0,63	0.03	0.04	
STD ERR	308	312	0,43	0,36			
	314	315	1,74	1,40	0.85	0,79	60
	316	317	-,60	1,77	0.98	0.91	60
	318	319	-,83	1,40	1.02	0,87	60
MEAN	314	318	0,10	1,52	0.95	0,86	
STD DEV	314	318	1,42	0,21	0.09	0,06	
STD ERR	314	318	0,82	0,12			
	320	321	-2,11	0,82	1.05	0,95	60

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	12	12	-8.21	2.87	1.32	1.46	1967-92A
	13	13	-5.76	4.21	1.35	1.47	1967-92A
	14	14	-4.14	2.31	1.17	1.32	1967-92A
	15	15	-4.82	5.08	1.20	1.31	1967-92A
MEAN	13		-5.73	3.62	1.26	1.39	
STD DEV	13		1.78	1.26	0.09	0.09	
STD ERR	13		0.89	0.63			
	16	16	-5.26	2.27	1.40	1.47	1967-92A
	17	17	-2.84	4.71	1.52	1.54	1967-92A
	18	18	-2.58	4.31	1.45	1.59	1967-92A
	19	19	-4.76	5.06	1.12	1.19	1967-92A
	20	20	-3.85	3.22	1.53	1.58	1967-92A
MEAN	18		-3.86	3.91	1.40	1.48	
STD DEV	18		1.17	1.15	0.17	0.17	
STD ERR	18		0.52	0.51			
	21	21	-5.80	5.95	1.14	1.23	1967-92A
	22	22	-5.20	4.92	1.31	1.41	1967-92A
	23	23	-5.53	5.76	1.33	1.39	1967-92A
	24	24	-4.38	6.82	1.37	1.42	1967-92A
	25	25	-5.30	8.02	1.37	1.42	1967-92A
MEAN	23		-5.24	6.29	1.30	1.38	
STD DEV	23		0.54	1.18	0.10	0.08	
STD ERR	23		0.24	0.53			
	26	26	-5.71	4.94	1.08	1.21	1967-92A
	27	27	-4.39	5.82	1.37	1.33	1967-92A
	28	28	-7.08	4.58	1.42	1.47	1967-92A
	29	29	-7.36	5.97	1.54	1.58	1967-92A
	30	30	-7.47	3.48	1.62	1.92	1967-92A
MEAN	28		-6.40	4.96	1.41	1.50	
STD DEV	28		1.33	1.01	0.20	0.27	
STD ERR	28		0.59	0.45			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	31	31	-3.13	5.89	1.39	1.51	1967-92A
	32	32	-5.19	5.24	1.62	1.67	1967-92A
	33	33	-5.35	6.16	1.77	1.62	1967-92A
	34	34	-4.40	4.06	1.06	1.21	1967-92A
	35	35	-6.24	4.08	1.40	1.39	1967-92A
MEAN	33		-4.86	5.08	1.45	1.48	
STD DEV	33		1.17	0.99	0.27	0.18	
STD ERR	33		0.52	0.44			
	36	36	-5.92	3.84	1.36	1.48	1967-92A
	37	37	-4.93	4.47	1.23	1.26	1967-92A
	38	38	-6.02	4.57	1.13	1.21	1967-92A
	39	39	-6.08	4.21	1.35	1.40	1967-92A
	40	40	-5.86	2.03	1.68	1.92	1967-48A
	40	40	-1.10	4.44	2.23	2.68	1967-34A
	40	40	-3.78	2.72	1.48	1.50	1967-92A
MEAN	38		-4.81	3.75	1.49	1.64	
STD DEV	38		1.84	0.99	0.37	0.51	
STD ERR	38		0.70	0.38			
	41	41	-4.75	0.48	1.49	1.65	1967-34A
	42	42	-4.25	7.79	2.31	2.40	1967-34A
	43	43	-6.49	7.14	1.18	1.31	1967-48A
	44	44	-8.11	8.58	1.21	1.41	1967-48A
	45	45	-2.76	4.44	1.33	1.41	1967-48A
	41	41	-4.08	4.42	1.11	1.23	1967-92A
	42	42	-6.70	4.90	1.27	1.33	1967-92A
	43	43	-4.84	3.39	1.44	1.67	1967-34A
	44	44	-3.07	3.45	1.96	2.19	1967-34A
	45	45	-2.35	5.07	1.57	1.51	1967-34A
	43	43	-5.61	6.25	1.31	1.52	1967-92A
	44	44	-5.51	6.46	1.30	1.56	1967-92A
	45	45	3.97	5.90	1.77	2.07	1968-12A
	45	45	-6.40	6.75	1.41	1.64	1967-92A
MEAN	43		-4.35	5.36	1.48	1.64	
STD DEV	43		2.90	2.10	0.33	0.35	
STD ERR	43		0.78	0.56			

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	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	46	46	-7.48	7.36	1.36	1.39	1967-48A
	47	47	-3.28	5.81	1.09	1.25	1967-48A
	48	48	-4.67	6.80	1.13	1.25	1967-48A
	49	49	-3.29	7.08	1.57	1.70	1967-34A
	50	50	-4.99	6.66	1.14	1.32	1967-48A
	46	46	-4.41	7.63	1.84	2.03	1967-34A
	47	47	-2.02	5.87	1.50	1.61	1967-34A
	48	48	-3.65	8.28	1.61	1.71	1967-34A
	49	49	-1.69	3.88	1.70	2.13	1968-12A
	50	50	-2.67	7.90	1.45	1.72	1967-34A
	46	46	-6.57	8.02	1.62	1.81	1968-12A
	47	47	-2.93	5.93	1.70	1.98	1968-12A
	48	48	-7.27	9.04	1.74	1.91	1968-12A
	49	49	-4.88	6.73	1.42	1.71	1967-92A
	50	50	-4.20	7.40	1.64	1.74	1968-12A
	46	46	-3.83	4.25	1.58	1.51	1967-92A
	47	47	-3.27	6.42	1.26	1.42	1967-92A
	48	48	-3.63	5.69	1.38	1.66	1967-92A
	50	50	-4.85	6.97	1.34	1.62	1967-92A
MEAN	48		-4.19	6.72	1.48	1.66	
STD DEV	48		1.60	1.30	0.22	0.26	
STD ERR	48		0.37	0.30			
	51	51	-5.77	8.12	1.53	1.80	1967-48A
	52	52	-4.01	7.54	1.17	1.28	1967-48A
	53	53	-6.65	8.69	1.06	1.22	1967-48A
	54	54	-5.52	8.24	1.20	1.45	1967-48A
	55	55	-4.04	7.42	1.06	1.20	1967-48A
	51	51	-4.49	5.13	1.30	1.45	1967-34A
	52	52	-5.66	8.49	1.42	1.71	1967-34A
	53	53	-4.21	8.15	1.78	2.00	1967-34A
	54	54	-5.93	8.41	1.16	1.28	1967-34A
	55	55	-4.44	5.00	1.57	1.65	1967-34A
	51	51	-2.36	8.18	1.74	2.02	1968-12A
	52	52	-3.78	7.75	1.86	2.09	1968-12A
	53	53	-2.75	3.94	1.39	1.73	1968-12A
	54	54	-7.33	6.25	1.43	1.76	1968-12A
	55	55	-.11	5.07	1.23	1.49	1968-12A
	51	51	-6.46	5.56	1.09	1.23	1967-92A
	52	52	-4.22	5.08	1.03	1.31	1967-92A
	53	53	-4.82	7.25	1.15	1.39	1967-92A
	54	54	-5.29	5.00	1.43	1.69	1967-92A
	55	55	-9.81	8.20	1.22	1.48	1967-92A
MEAN	53		-4.88	6.87	1.34	1.56	
STD DEV	53		2.01	1.55	0.25	0.28	
STD ERR	53		0.45	0.35			

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	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	56	56	-3.28	7.10	1.28	1.32	1967-48A
	57	57	-2.99	5.31	1.40	1.59	1967-48A
	58	58	-5.80	7.84	1.46	1.54	1967-48A
	59	59	-3.98	6.12	1.40	1.58	1967-48A
	60	60	-3.96	4.56	1.21	1.42	1967-48A
	56	56	-5.06	10.13	1.45	1.53	1967-34A
	57	57	-3.30	4.42	1.99	2.16	1967-34A
	58	58	-3.48	10.30	1.36	1.56	1967-34A
	59	59	-.87	10.62	2.19	2.10	1967-34A
	60	60	-3.59	7.27	1.75	1.93	1967-34A
	56	56	-6.11	6.62	1.82	2.09	1968-12A
	57	57	-2.78	6.95	1.64	1.87	1968-12A
	58	58	-7.74	4.28	2.19	2.16	1968-12A
	59	59	1.47	6.38	2.36	3.14	1968-12A
	60	60	-7.05	8.01	1.60	1.78	1968-12A
	56	56	-3.12	6.59	1.21	1.30	1967-92A
	57	57	-5.89	7.77	1.26	1.61	1967-92A
	58	58	-4.32	7.45	1.10	1.28	1967-92A
	59	59	-4.40	7.44	0.97	1.27	1967-92A
	60	60	-6.25	4.72	1.28	1.42	1967-92A
MEAN	58		-4.13	7.00	1.55	1.73	
STD DEV	58		2.12	1.87	0.39	0.45	
STD ERR	58		0.47	0.42			
	61	61	-1.66	7.17	1.22	1.34	1967-48A
	62	62	-3.37	9.23	1.28	1.37	1967-48A
	63	63	-4.33	7.41	1.64	1.51	1967-48A
	64	64	-3.60	10.51	0.99	1.11	1967-48A
	65	65	-4.39	7.03	1.37	1.61	1967-92A
	61	61	-3.11	6.93	2.33	2.19	1967-34A
	62	62	-.74	4.31	1.87	2.23	1967-34A
	63	63	-2.06	7.68	1.43	1.75	1967-34A
	64	64	-3.64	7.71	1.42	1.72	1967-92A
	61	61	-4.64	9.17	1.84	2.24	1968-12A
	62	62	-4.97	5.86	1.55	1.68	1968-12A
	63	63	-1.91	8.67	1.48	1.82	1968-12A
	61	61	-2.32	8.44	1.29	1.48	1967-92A
	62	62	-5.52	6.16	1.51	1.49	1967-92A
	63	63	-5.25	4.05	1.57	1.85	1967-92A
MEAN	63		-3.43	7.36	1.52	1.69	
STD DEV	63		1.44	1.77	0.32	0.34	
STD ERR	63		0.37	0.46			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	197C	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	66	66	-5.91	5.55	1.46	1.68	1967-48A
	67	67	-3.48	9.03	1.39	1.69	1967-48A
	68	68	-7.42	13.94	1.65	1.88	1967-48A
	69	69	-4.73	7.95	1.20	1.31	1967-92A
	70	70	-3.54	7.98	1.08	1.44	1967-92A
	66	66	-3.50	5.76	1.32	1.67	1967-92A
	67	67	-4.60	6.16	1.73	1.87	1967-92A
	68	68	-4.06	7.92	1.12	1.35	1967-92A
MEAN	68		-4.66	8.04	1.37	1.61	
STD DEV	68		1.39	2.69	0.24	0.22	
STD ERR	68		0.49	0.95			
	71	71	-5.43	9.10	1.22	1.48	1967-92A
	72	72	-3.78	5.69	1.21	1.64	1967-92A
	73	73	-4.58	9.62	1.22	1.62	1967-92A
	74	74	-1.95	6.87	1.47	1.65	1967-92A
	75	75	-3.54	10.07	1.10	1.41	1967-92A
MEAN	73		-3.85	8.27	1.24	1.56	
STD DEV	73		1.30	1.89	0.13	0.11	
STD ERR	73		0.58	0.85			
	76	76	-2.23	8.23	1.75	2.02	1967-92A
	77	77	-4.78	8.75	1.07	1.44	1967-92A
	78	78	-2.26	8.93	1.14	1.36	1967-92A
	79	79	-3.64	9.46	1.42	1.76	1967-92A
	80	80	-2.10	6.67	1.28	1.43	1967-92A
MEAN	78		-3.00	8.41	1.33	1.60	
STD DEV	78		1.17	1.07	0.27	0.28	
STD ERR	78		0.53	0.48			
	81	81	-1.51	8.98	1.16	1.54	1967-92A
	82	82	-.89	8.06	1.09	1.41	1967-92A
	83	83	-2.31	8.98	1.44	1.73	1967-92A
	84	84	-1.85	9.66	0.97	1.06	1967-92A
	85	85	-4.73	9.07	1.28	1.35	1967-92A
MEAN	83		-2.26	8.95	1.19	1.42	
STD DEV	83		1.48	0.57	0.18	0.25	
STD ERR	83		0.66	0.26			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	86	86	-2.52	11.06	1.18	1.38	1967-92A
	87	87	-4.86	10.11	1.39	1.58	1967-92A
	88	88	-.83	12.29	1.06	1.35	1967-92A
	89	89	-4.71	11.15	1.33	1.61	1967-92A
	90	90	-1.17	9.88	1.16	1.27	1967-92A
MEAN	88		-2.82	10.90	1.22	1.44	
STD DEV	88		1.90	0.96	0.13	0.15	
STD ERR	88		0.85	0.43			
	91	91	-2.21	11.73	1.22	1.37	1967-92A
	92	92	-1.90	12.47	1.75	1.89	1967-92A
	93	93	-4.37	11.02	1.11	1.28	1967-92A
	94	94	-.51	11.00	1.16	1.19	1967-92A
	95	95	-3.49	8.19	1.21	1.51	1967-92A
MEAN	93		-2.50	10.88	1.29	1.45	
STD DEV	93		1.49	1.62	0.26	0.27	
STD ERR	93		0.67	0.73			
	96	96	-1.42	8.95	1.21	1.39	1967-92A
	97	97	-1.77	11.84	1.15	1.38	1967-92A
	98	98	-.81	9.15	1.15	1.32	1967-92A
	99	99	-3.32	11.55	1.38	1.61	1967-92A
	100	100	-.40	12.94	1.49	1.63	1967-92A
MEAN	98		-1.54	10.89	1.28	1.47	
STD DEV	98		1.13	1.76	0.15	0.14	
STD ERR	98		0.50	0.79			
	101	101	-1.34	11.58	1.55	1.94	1967-92A
	102	102	-.26	10.37	1.34	1.61	1967-92A
	103	103	-1.93	11.58	1.18	1.34	1967-92A
	104	104	-.30	9.16	1.24	1.37	1967-92A
	105	105	-3.19	12.93	1.26	1.55	1967-92A
MEAN	103		-1.41	11.12	1.31	1.56	
STD DEV	103		1.22	1.42	0.15	0.24	
STD ERR	103		0.55	0.64			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	106	106	0.69	13.06	1.40	1.52	1967-92A
	107	107	-2.39	13.31	1.26	1.55	1967-92A
	108	108	-1.01	12.69	1.61	1.66	1967-92A
	109	109	-2.74	10.56	1.40	1.59	1967-92A
	110	110	-2.73	14.97	1.08	1.22	1967-92A
MEAN	108		-1.64	12.92	1.35	1.51	
STD DEV	108		1.48	1.58	0.20	0.17	
STD ERR	108		0.66	0.71			
	111	111	-2.05	9.11	1.37	1.68	1967-92A
	112	112	-2.44	11.00	1.03	1.21	1967-92A
	113	113	-1.68	13.49	1.08	1.26	1967-92A
	114	114	0.81	9.34	1.29	1.39	1967-92A
	115	115	-2.36	12.21	1.35	1.66	1967-92A
MEAN	113		-1.54	11.03	1.22	1.44	
STD DEV	113		1.35	1.87	0.16	0.22	
STD ERR	113		0.60	0.84			
	116	116	1.08	10.27	1.26	1.40	1967-92A
	117	117	0.44	13.29	1.39	1.54	1967-92A
	118	118	-.46	12.84	0.98	1.12	1967-92A
	119	119	-1.54	12.11	0.97	1.12	1967-92A
	120	120	3.79	10.77	1.31	1.51	1967-92A
MEAN	118		0.66	11.86	1.18	1.34	
STD DEV	118		2.01	1.30	0.20	0.20	
STD ERR	118		0.90	0.58			
	121	121	-1.69	13.73	1.17	1.37	1967-92A
	122	122	0.43	11.29	1.15	1.29	1967-92A
	123	123	0.47	11.14	1.12	1.27	1967-92A
	124	124	-.75	13.76	1.09	1.30	1967-92A
	125	125	0.64	9.75	1.01	1.20	1967-92A
MEAN	123		-.18	11.94	1.11	1.29	
STD DEV	123		1.01	1.76	0.06	0.06	
STD ERR	123		0.45	0.79			

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DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	126	126	-.25	13.92	0.92	1.10	1967-92A
	127	127	0.48	11.39	1.15	1.15	1967-92A
	128	128	-1.03	12.99	1.73	1.67	1967-92A
	129	129	0.63	11.43	1.20	1.30	1967-92A
	130	130	1.50	10.93	1.16	1.36	1967-92A
MEAN	128		0.27	12.13	1.23	1.32	
STD DEV	128		0.96	1.27	0.30	0.22	
STD ERR	128		0.43	0.57			
	131	131	3.14	12.77	0.92	1.05	1967-92A
	132	132	1.74	10.74	1.27	1.48	1967-92A
	133	133	-.58	13.38	0.97	1.05	1967-92A
	134	134	3.64	11.81	1.23	1.39	1967-92A
	135	135	0.94	12.80	1.25	1.36	1967-92A
MEAN	133		1.78	12.30	1.13	1.27	
STD DEV	133		1.70	1.04	0.17	0.20	
STD ERR	133		0.76	0.46			
	136	136	1.91	10.32	1.39	1.56	1967-92A
	137	137	0.73	12.04	1.17	1.21	1967-92A
	138	138	2.21	11.56	1.27	1.33	1967-92A
	139	139	-.58	10.53	0.76	0.88	1967-92A
	140	140	3.11	14.82	1.43	1.58	1967-92A
MEAN	138		1.48	11.86	1.20	1.31	
STD DEV	138		1.43	1.80	0.27	0.29	
STD ERR	138		0.64	0.81			
	141	141	2.51	13.14	0.91	1.03	1967-92A
	142	142	3.82	14.29	1.14	1.45	1967-92A
	143	143	3.45	9.65	1.31	1.49	1967-92A
	144	144	1.52	15.08	1.15	1.29	1967-92A
	145	145	2.17	10.98	1.09	1.23	1967-92A
MEAN	143		2.69	12.63	1.12	1.30	
STD DEV	143		0.94	2.27	0.14	0.18	
STD ERR	143		0.42	1.02			

DAHLGREN POLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	146	146	2.88	12.14	1.43	1.52	1967-92A
	147	147	1.72	11.65	1.50	1.80	1967-92A
	148	148	5.34	10.43	1.13	1.17	1967-92A
	149	149	2.46	13.57	1.05	1.20	1967-92A
	150	150	4.10	10.10	1.41	1.39	1967-92A
MEAN	148		3.30	11.58	1.30	1.42	
STD DEV	148		1.43	1.40	0.20	0.26	
STD ERR	148		0.64	0.62			
	151	151	3.33	13.81	1.20	1.32	1967-92A
	152	152	6.35	10.78	1.73	1.67	1967-92A
	153	153	3.73	15.46	1.02	1.11	1967-92A
	154	154	3.56	11.50	1.38	1.60	1967-92A
	155	155	2.70	15.16	1.07	1.15	1967-92A
MEAN	153		3.94	13.34	1.28	1.37	
STD DEV	153		1.41	2.12	0.29	0.26	
STD ERR	153		0.63	0.95			
	156	156	3.90	12.80	1.32	1.51	1967-92A
	157	157	4.45	11.30	0.93	1.04	1967-92A
	158	158	2.76	13.50	1.04	1.15	1967-92A
	159	159	4.26	10.92	1.03	1.21	1967-92A
	160	160	0.05	14.26	1.63	1.76	1967-92A
MEAN	158		3.08	12.56	1.19	1.34	
STD DEV	158		1.82	1.42	0.28	0.30	
STD ERR	158		0.81	0.64			
	161	161	5.85	10.17	1.33	1.49	1967-92A
	162	162	2.57	11.37	1.39	1.50	1967-92A
	163	163	5.72	11.36	1.53	1.63	1967-92A
	164	164	5.69	10.52	1.36	1.52	1967-92A
	165	165	3.59	12.58	1.16	1.25	1967-92A
MEAN	163		4.69	11.20	1.36	1.48	
STD DEV	163		1.51	0.93	0.14	0.14	
STD ERR	163		0.68	0.42			

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DAHLGREN PCLAR MONITORING SERVICE

	DAYS	1970	POLE POSITION X METERS	POLE POSITION Y METERS	STANDARD ERROR X METERS	STANDARD ERROR Y METERS	SATELLITE
	166	166	5.02	13.11	1.56	1.70	1967-92A
	167	167	5.28	12.75	1.03	1.23	1967-92A
	168	168	3.77	12.70	1.29	1.48	1967-92A
	169	169	3.80	11.94	1.50	1.54	1967-92A
	170	170	7.79	9.88	1.68	1.73	1967-92A
MEAN	168		5.13	12.08	1.41	1.54	
STD DEV	168		1.64	1.30	0.25	0.20	
STD ERR	168		0.73	0.58			
	171	171	4.57	12.30	0.90	0.97	1967-92A
	172	172	5.71	11.41	1.49	1.55	1967-92A
	173	173	3.91	10.27	0.94	1.07	1967-92A
	174	174	5.31	11.10	1.21	1.38	1967-92A
	175	175	6.17	11.89	0.97	1.07	1967-92A
MEAN	173		5.13	11.39	1.10	1.21	
STD DEV	173		0.90	0.78	0.25	0.25	
STD ERR	173		0.40	0.35			
	178	178	5.47	10.43	1.06	1.05	1967-92A
	179	179	4.58	14.65	1.07	1.28	1967-92A
	180	180	4.35	12.24	1.08	1.22	1967-92A
MEAN	179		4.80	12.44	1.07	1.18	
STD DEV	179		0.59	2.12	0.01	0.12	
STD ERR	179		0.34	1.22			
	181	181	4.52	9.87	1.32	1.61	1967-92A
	182	182	6.64	10.63	1.35	1.34	1967-92A
	183	183	5.41	13.01	1.84	1.94	1967-92A
	184	184	8.34	10.86	1.05	0.98	1967-92A
	185	185	5.42	10.95	1.53	1.54	1967-92A
MEAN	183		6.07	11.06	1.42	1.48	
STD DEV	183		1.48	1.17	0.29	0.36	
STD ERR	183		0.66	0.52			
	186	186	6.14	10.22	1.43	1.49	1967-92A
	187	187	3.52	11.93	1.31	1.25	1967-92A
	188	188	5.86	8.53	1.60	1.76	1967-92A
	189	189	2.80	9.63	0.93	0.98	1967-92A
MEAN	187		4.58	10.08	1.32	1.37	
STD DEV	187		1.67	1.42	0.29	0.33	
STD ERR	187		0.83	0.71			

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